

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

CARNEGIE MELLON UNIVERSITY,)	
)	
Plaintiff,)	
)	
vs.)	Civil Action No. 09-290
)	Judge Nora Barry Fischer
MARVELL TECHNOLOGY GROUP, LTD.)	
et al.,)	
)	
Defendants.)	

MEMORANDUM OPINION

I. INTRODUCTION/BACKGROUND

This is a patent infringement case brought by Plaintiff Carnegie Mellon University (“CMU”), against Defendants Marvell Technology Group, Ltd. and Marvell Semiconductor, Inc. (collectively “Marvell”), alleging that Marvell has infringed two of its patents, U.S. Patent Nos. 6,201,839 (the “‘839 Patent”) and 6,438,180 (the “‘180 Patent”) (collectively, the “CMU Patents”), for which the Court conducted a four-week jury trial from November to December of 2012. (Docket No. 760). The jury rendered its verdict on December 26, 2012 in favor of CMU on infringement, validity and willfulness, and awarded damages in the amount of \$1,169,140,271.00. (Docket No. 762).¹ The Court has continued to preside over hotly contested

¹ As the parties are well aware of the factual and procedural background of this case and the Court has already written extensively on the facts of this case, (*see* Docket Nos. 900, 901, 920), the Court will limit its discussion to the background necessary for the resolution of the current motions. For convenience, the Court cites to the docket numbers associated with these previously issued opinions on its own docket throughout this decision but notes that the opinions resolving post-trial motions are available at the following citations: (1) denying the mistrial, *see Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd.*, Civ. A. No. 09-290, 2013 WL 4511293 (W.D. Pa. Aug. 23, 2013); (2) resolving the parties’ motions for judgment as a matter of law (“JMOLs”), *see Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd.*, Civ. A. No. 09-290, --- F. Supp. 2d ---, 2013 WL 5332108, at *41-42 (W.D. Pa. Sept. 23,

post-trial proceedings in this case, which has included extensive briefing and post-trial evidentiary submissions, a two-day motion hearing, supplemental briefing on disputed legal points and periodic joint status reports from the parties as to Marvell's continuing sales of the infringing technology. The Court has moved sequentially through the post-trial motions and issued a number of decisions, including: (1) denying Marvell's motion for a mistrial, (Docket No. 900); (2) resolving the parties' challenges to the sufficiency of the evidence supporting the jury's verdict on liability, damages and willfulness but reserving ruling on the financial penalty to be imposed as a result of Marvell's willful infringement, (Docket No. 901); and (3) denying Marvell's equitable defense of laches, which could have substantially reduced the jury's award, (Docket No. 920). All of those decisions are incorporated by reference herein. (Docket Nos. 900, 901, 920).

At this juncture, the jury's verdict of \$1,169,140,271.00, which has been adopted as a judgment filed on January 14, 2013, has been sustained. (Docket Nos. 762, 769, 901). The jury's verdict represents one hundred percent (100%) of the compensatory damages sought by CMU at trial for Marvell's infringement of the patented methods. (*Id.*). It also signifies that the jury wholly adopted the testimony of CMU's damages expert, Catharine Lawton, who opined that a hypothetical negotiation between the parties would have resulted in a reasonable royalty of \$0.50 per Accused Chip sold by Marvell during the relevant time period (the royalty base) and would result in the exact damages figure which was awarded by the jury. (Docket No. 686 at 61). Ms. Lawton's opinions have been heavily scrutinized by the Court in prior decisions (including *Daubert* challenges both before and during trial) and the decisions on those issues are

2013); and (3), denying the motion for judgment on laches, *see Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd.*, Civ. A. No. 09-290, 2014 WL 183212 (W.D. Pa. Jan. 14, 2014).

likewise incorporated by reference herein. (Docket Nos. 451, 713, 901). Relevant here, Ms. Lawton's testified to the following damages computations:

Damages Period	Royalty Base	Royalty Rate	Damages
3/6/03-3/5/09	1,109,100,006	\$0.50	\$554,550,003
3/6/09-7/28/12	1,229,180,536	\$0.50	\$614,590,268
3/6/03-7/28/12	2,338,380,542	\$0.50	\$1,169,140,271

(Docket No. 633-1 at 7). While the post-trial motions were pending, the Court ordered a number of post-trial accountings regarding Marvell's continuing sales of Accused Chips² and the parties filed status reports providing such information. (Docket Nos. 885, 886, 904). Through this process, the parties met and conferred and generally agreed³ that Marvell has made the following sales of Accused Chips in the subsequent periods:

Period	Sales
7/29/12 – 1/14/13	159,100,576
1/15/13-8/3/13	204,652,009
8/4/13 – 11/2/13	94,390,559

(Docket Nos. 889, 907, 901 at n.136). The Court has not ordered additional status reports at this time because the same are unnecessary to the Court's present decisions. However, updated accountings will be ordered in conjunction with the Court's rulings set forth below.

² As noted in the Court's prior Opinions, "Accused Chips" refers to Marvell's read channel and SOC chips containing the infringing technology. (See Docket No. 901 at 16).

³ In the latest status report dated November 2, 2013, the parties dispute the amount of revenue generated for this period of time and CMU objects to Marvell presenting the sales data in a form which breaks out international and domestic sales of Marvell's products. (Docket No. 907). These disputes have no bearing on the instant matters.

Turning back to the pending matters before the Court, all of the remaining post-trial motions involve CMU's efforts to seek to increase this substantial award and/or to seek a reasonable royalty for ongoing infringement by Marvell or enjoin it from same.⁴ CMU seeks all of the following in addition to its billion dollar jury verdict:

- supplemental damages of \$79,550,288;
- prejudgment interest of up to \$326,144,393.25;
- enhanced damages of up to three times the jury's verdict and supplemental damages (i.e., for a total verdict of \$3,746,071,677);
- 0.14% post-judgment interest on the jury's verdict, and any supplemental damages, attorneys' fees (the issue of attorneys' fees has been deferred by the Court until any appeals are resolved), and/or prejudgment interest which may be awarded, compounded annually;
- a permanent injunction preventing Marvell from further production of any products which infringe CMU's patented methods because Marvell is allegedly a "collection risk," and,
- an on-going running royalty of up to \$1.50 per chip on all of Marvell's post-judgment sales of chips containing the infringing technology.

(Docket Nos. 786, 788, 790). Marvell essentially concedes that an award of supplemental damages and post-judgment interest are appropriate in light of the jury's verdict but opposes

⁴ However, before the Court was able to finalize its rulings on these remaining matters, all of which potentially inure to CMU's benefit, including the outstanding motion to treble the damages award, CMU saw fit to bring a series of motions seeking to register the judgment, initiate execution of same, and sought guidance from the Court on how to proceed as negotiations over Marvell's acquisition of a supersedeas bond in advance of its appeal to the Federal Circuit have not progressed as quickly as CMU would like. (Docket Nos. 908, 909). CMU also put forth financial documents and other evidence which it claimed showed that Marvell was seeking to avoid its financial obligations under the jury's verdict, including an acquisition of approximately five percent (5%) of its common stock by an investment firm and turnover of key members of its management team and Board of Directors. Marvell countered with its own evidence showing that these were business decisions unconnected to the present litigation. (*Id.*). These motions were extensively briefed by the parties, all of which the Court considered prior to summarily denying such motions, holding that all of CMU's requests were premature in light of the outstanding matters. Undeterred by the Court's Orders, CMU then filed additional papers wherein it essentially asked the Court to supervise the parties' negotiations on the bond issues. (Docket No. 919). After even more briefing was submitted, and reviewed and considered, the Court appointed a Special Master to act in this capacity, so that the Court could focus on the tasks at hand rather than mediate the parties' ongoing negotiations. (Docket Nos. 928, 930).

CMU's requests for prejudgment interest, enhanced damages, a permanent injunction and/or a reasonable royalty on future sales of the Accused Chips. (Docket Nos. 824, 828, 833, 861-863).

CMU's requests are framed as its Motion for Prejudgment and Post-Judgment Interest, (Docket No. 788), Motion for a Permanent Injunction, Post-Judgment Royalties, and Supplemental Damages, (Docket No. 786), and Motion for a Finding of Willful Infringement and Enhanced Damages,⁵ (Docket No. 790). These matters have been completely briefed, (Docket Nos. 787; 789; 790; 793; 834; 836; 837; 850; 852; 853; 861; 862; 863), and the Court heard argument on same on May 1 and May 2, 2013. (Docket No. 873). The transcripts of these proceedings were filed on May 15, 2013. (Docket Nos. 880; 881).⁶ The parties have also submitted status reports and supplemental briefing on certain issues. (Docket No. 889, 891, 893, 896, 897, 898, 905, 906). Accordingly, these motions are now ripe for disposition. Upon careful consideration of all of the parties' submissions, oral argument, and for the following reasons, CMU's Motions [788], [786] and [790] are granted, in part, and denied, in part. More specifically,

- CMU's Motion for Prejudgment and Post-Judgment Interest [788] is granted to the extent that CMU seeks post-judgment interest under 18 U.S.C. § 1961 but denied to the extent that CMU seeks prejudgment interest under 35 U.S.C. § 284;
- CMU's Motion for a Permanent Injunction, Post-Judgment Royalties, and Supplemental Damages [786] is granted to the extent that CMU will be awarded supplemental damages in the amount of \$79,550,288.00; denied to the extent that a permanent injunction is sought; and granted, in part, as the Court will order an on-going royalty of \$0.50 per sale of Accused Chips by Marvell; and,
- CMU's Motion for a Finding of Willful Infringement and Enhanced Damages [790] is granted to the extent that the Court

⁵ The Court has already made a finding of willful infringement. (Docket No. 901 at 67-81). The Court has also denied, without prejudice, CMU's request for Attorney Fees. (Docket No. 884).

⁶ The parties likewise filed their hearing slides (Docket Nos. 874, 875).

will award enhanced damages at a rate of 1.23 multiplied by the jury's award and supplemental damages, for a total enhancement of \$287,198,828.60, but denied to the extent that CMU seeks enhanced damages at a higher rate.

II. MOTIONS SEEKING RELIEF UNDER 35 U.S.C. § 284

CMU's post-trial motions for supplemental damages, prejudgment interest and enhanced damages seek relief under the patent damages statute, 35 U.S.C. § 284, which provides that:

[u]pon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court.

When the damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed. ...

The court may receive expert testimony as an aid to the determination of damages or of what royalty would be reasonable under the circumstances.

35 U.S.C. § 284. The decisions as to whether to award supplemental damages, prejudgment interest and enhanced damages are respectively committed to the sound discretion of the trial court, in light of the developing precedent of the Supreme Court and Federal Circuit on these issues. “Although courts have broad discretion in determining appropriate relief for patent infringement ... damages must be tailored to the circumstances and be correlatively determined.” *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1212-13 (Fed. Cir. 2010) (quoting *Carborundum Co. v. Molten Metal Equip. Innovations, Inc.*, 72 F.3d 872, 881 (Fed. Cir. 1995)). The Court will address these matters sequentially, starting with supplemental damages.

A. Supplemental Damages

CMU's request for supplemental damages for all infringing sales of Accused Chips that were not included in the jury's verdict and accrued until the judgment was entered on January

14, 2013 is rather uncontroversial. (Docket No. 787 at 19; Docket No. 837 at 26). The parties agree that the jury's verdict of \$1,169,140,271.00 included damages sustained by CMU during the period of March 3, 2006 through July 29, 2012, a period which did not include the full damages period which ended as of January 14, 2013. (*Id.*). The parties have likewise stipulated that the accrued supplemental damages for this additional period (i.e., from July 29, 2012 to January 14, 2013) is \$79,550,288.00. (Docket No. 889 at 3). Such figure was calculated by multiplying the reasonable royalty found by the jury of \$0.50 per chip times the royalty base of 159,100,576 Accused Chips which Marvell sold during the supplemental damages period. (*Id.* at 3).

It is well settled that a prevailing patentee is due the damages for uncalculated pre-verdict sales through the date of the entry of judgment. *See Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1380-81 (Fed. Cir. 2013); *see also Finjan*, 626 F.3d at 1213. The Court finds that supplemental damages are properly awarded to CMU for the period of July 29, 2012 through January 14, 2013 because the jury did not have the opportunity to assess them due to a lack of financial information regarding Marvell's ongoing sales of Accused Chips at the time of trial. *See* 35 U.S.C. § 284 ("When the damages are not found by a jury, the court shall assess them."). Further, the parties' stipulations are consistent with the jury's verdict, which awarded \$0.50 per all of Marvell's infringing sales of Accused Chips, during the relevant period. *Id.* Accordingly, CMU's Motion [786] is granted to the extent that it seeks supplemental damages and CMU is awarded supplemental damages of \$79,550,288.00. The Court will analyze CMU's companion requests for an ongoing royalty and periodic accountings resulting from Marvell's continuing post-judgment infringement in section IV.B., *infra*.⁷

⁷ The parties' status reports reflect that an additional 299,042,568 Accused Chips have been sold as of November 2, 2013, which consists of sales of 204,652,009 Accused Chips from January 15, 2013 to August 3, 2013

B. Prejudgment Interest

The Court next addresses CMU's motion for prejudgment interest, which remains hotly contested by Marvell. (Docket Nos. 788-89, 824, 852, 861). CMU has set forth three separate proposals in support of its request for an award of prejudgment interest on the entirety of the jury's verdict and supplemental damages by applying either: (1) the Pennsylvania state statutory rate of 6%, compounded quarterly, resulting in \$326,144,393.25; (2) the rate of its investment returns, compounded quarterly, resulting in \$285,054,096.75; or, (3) the prime rate, compounded quarterly, resulting in \$211,538,112.38. (Docket Nos. 788; 898). Marvell contends that prejudgment interest should be denied in its entirety, or limited through the application of a lower interest rate or by compounding the figures annually rather than quarterly. (Docket Nos. 824, 861).

In large measure, the parties have set forth positions akin to those advocated in the context of Marvell's assertion of the defense of laches, with CMU touting that prejudgment interest is necessary to make it whole and provide compensation for its lost opportunity to invest the reasonable royalties it is owed and Marvell countering that CMU's delays in bringing this case caused it prejudice, undermining the request for prejudgment interest. (Docket Nos. 788-89, 824, 852, 861). As noted, the Court denied Marvell's motion for judgment on laches in a lengthy decision dated January 14, 2014. (Docket No. 920). There, the Court found that Marvell met its burden to demonstrate by a preponderance of the evidence both that: (1) CMU's delays in prosecuting this lawsuit were unreasonable and inexcusable; and (2) Marvell was prejudiced, in part, by the delays, because CMU did not take reasonable steps to preserve the full quantum of potential evidence during the laches period. (*Id.*). However, the Court denied Marvell's laches

(\$102,326,004.50) and 94,390,559 Accused Chips from August 4, 2013 to November 2, 2013 (\$47,195,279.50). (Docket Nos. 901 at n. 136; 907).

defense after weighing the equities between the parties, finding that Marvell's willful infringement outweighed CMU's negligence in failing to reasonably protect its patent rights through enforcement activities against Marvell. (*Id.*). The ultimate effect of this decision was to sustain the jury's award of approximately \$545 million in pre-suit damages for the period of March 6, 2003 through the date the lawsuit was filed March 6, 2009. (*Id.*).

The Court recognizes that the issue of prejudgment interest is analytically distinct from its earlier laches inquiry; however, the Court views the parties' arguments as to the appropriateness of an award of prejudgment interest through the prism of its analysis and factual findings on the laches defense and with due consideration of the financial impact of that decision. (Docket No. 920). The Court likewise understands that its prior rejection of the laches defense, on equitable grounds, is not dispositive on the issue of prejudgment interest. *See e.g., Enzo Biochem, Inc. v. Applera Corp.*, Civ. A. No. 3:04-cv-929, 2014 WL 29126, at *2 (D. Conn. Jan. 3, 2014); *Humanscale Corp. v. CompX Int'l Inc.*, Civ. A. No. 09-cv-86, 2010 WL 3397455, at *2 (E.D. Va. Aug. 23, 2010); *Church & Dwight Co., Inc. v. Abbott Labs.*, No. 05–2142(GEB)(LHG), 2009 WL 2230941, at *7 (D.N.J. 2009).

With that said, the parties do not dispute that the award of prejudgment interest under section 284, including the rate of prejudgment interest to be applied and whether to compound any prejudgment interest awarded, are discretionary matters for the Court. *See Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 939 F.2d 1540, 1545 (Fed. Cir. 1991) (internal citations omitted) (“[a] trial court is afforded wide latitude in the selection of interest rates, and may award interest at or above the prime rate.”). The Supreme Court has held that an award of prejudgment interest is ordinarily appropriate in patent cases, reasoning that:

[i]n the typical case an award of prejudgment interest is necessary to ensure that the patent owner is placed in as good a position as he

would have been in had the infringer entered into a reasonable royalty agreement. An award of interest from the time that the royalty payments would have been received merely serves to make the patent owner whole, since his damages consist not only of the value of the royalty payments but also of the foregone use of the money between the time of infringement and the date of the judgment.

Gen. Motors Corp. v. Devex Corp., 461 U.S. 648, 655-56 (1983). Despite its pronouncement that prejudgment interest is generally appropriate, the Supreme Court clarified that district courts retain discretion to limit or deny prejudgment interest in certain circumstances, such as where the patentee has been responsible for undue delays in prosecuting the lawsuit. *Gen. Motors*, 461 U.S. at 657. Yet, the Federal Circuit has emphasized that “absent prejudice to the defendants, any delay by [the patentee] does not support the denial of prejudgment interest.” *Crystal Semiconductor Corp. v. TriTech Microelectronics Int’l, Inc.*, 246 F.3d 1336, 1361-62 (Fed. Cir. 2001) (internal citations omitted). Because the award of prejudgment interest is not unique to patent law, it is determined under the law of the regional circuit, prompting this Court to also look to precedent from the Court of Appeals for the Third Circuit in deciding these issues. *Transmatic, Inc. v. Gulton Indus., Inc.*, 180 F.3d 1343, 1347 (Fed. Cir. 1999). The Third Circuit advises that a district court should consider and balance the following factors before exercising its discretion to award prejudgment interest:

- (1) whether the claimant has been less than diligent in prosecuting the action;
- (2) whether the defendant has been unjustly enriched;
- (3) whether an award would be compensatory; and,
- (4) whether countervailing equitable considerations militate against a surcharge.

Feather v. United Mine Workers of Am., 711 F.2d 530, 540 (3d Cir. 1983).

Having fully considered the totality of the circumstances in this case, in light of the aforementioned precedent from the Supreme Court and Federal Circuit, demanding a showing of delays by the patentee and prejudice to the infringer, *see Gen. Motors Corp.*, 461 U.S. at 655-56 and *Crystal Semiconductor Corp.*, 246 F.3d at 1361-62, each of which were found satisfied in the context of the Court's laches decision, (*see* Docket No. 920), and after weighing the factors set forth by the Court of Appeals for the Third Circuit, *see Feather*, 711 F.2d at 540, the Court finds that CMU's exceptional delays in prosecuting this case and its corresponding failure to timely investigate the infringement allegations fully justify denying CMU's request for prejudgment interest.

In this Court's estimation, the first factor, which requires a showing of diligence in prosecution of the action, plainly favors Marvell. To this end, the Court reiterates its prior holding that CMU unreasonably and inexcusably delayed filing this litigation for a period of five years and eleven months because it failed to timely conduct a sufficient investigation into infringement allegations brought to its attention by the inventors, Drs. Aleksandar Kavcic and Jose Moura. (Docket No. 920 at 34-54). CMU's delays were also largely self-serving as the evidence shows that it did not take the inventors' initial allegations seriously and conducted only a cursory investigation of infringement by contacting its Data Storage Systems Center ("DSSC") partner, Seagate, for a free opinion on the matter, without disclosing that it was Marvell – Seagate's own chip vendor – which was allegedly infringing. *See id.*; *see also Crystal Semiconductor Corp.*, 246 F.3d at 1362 (holding that "self-serving" delays warranted denial of prejudgment interest). The record further demonstrates that until November of 2008, CMU chose not to invest the time and money it would take to investigate the alleged infringement,

even after the inventors provided significant information about the infringement to CMU many years earlier, with continued updates throughout the laches period. For example,

- CMU was notified in April of 2003 that Marvell was producing chips “exactly” as the inventors set forth in their papers and claimed in the patents;
- CMU was told in July of 2004 that Marvell had a subroutine in its detector named after Dr. Kavcic and was marketing new chips designed to combat media noise and Dr. Kavcic demanded that a lawsuit be initiated; and,
- CMU was advised that Marvell had obtained its ‘585 Patent⁸ citing CMU’s Patents as prior art in early 2006.

(Docket No. 920 (citing, at various points, Def. Exs. 212, 246, 266; Docket Nos. 816-1 at 4; 816-4 at 10-12; 674 at 220-21)). Additionally, CMU never followed up with Seagate, which purchased millions of the Accused Chips from Marvell during this period of CMU’s inaction and Seagate then incorporated the Accused Chips into its hard drives and sold them to third parties down the stream of commerce. (Docket No. 920; Def. Ex. 213, 214). Indeed, CMU’s decision to commence a full investigation of Marvell’s infringement only occurred in late 2008 *after* the inventors attempted to obtain the patents from CMU through a release in order to pursue a lawsuit without CMU and with financial support from Astro Teller of Cerebellum Capital and potentially a hedge fund. (*Id.* (citing Def. Ex. 306)). This lack of timely action cannot suffice to demonstrate diligence. *See Feather*, 711 F.2d at 540.

The Court believes that the second factor requiring unjust enrichment by Marvell is neutral, when viewed in the context of the Court’s laches decision. Again, the Court determined that Marvell was prejudiced by CMU’s delays because CMU failed to preserve all potentially relevant evidence (including, among other things, emails and notebooks previously maintained

⁸ As noted in prior decisions, the ‘585 Patent refers to U.S. Patent Number 6,931,585, filed in 2002, with Dr. Zinning Wu and Mr. Gregory Burd listed as inventors, related to MNP technology. (Def. Ex. 266).

by the inventors) during the laches period. (Docket No. 920 at 54-61). The Court adds that although it found an insufficient nexus to demonstrate “economic prejudice” in the context of the laches defense, (*id.* at 61-68), it is undisputed that Marvell’s sales of chips containing the infringing technology increased dramatically during the period of CMU’s delays and thereafter, causing CMU’s damages to escalate substantially into the billion dollar jury award.⁹ *See id.* at 68 (“At most, Marvell has shown that its exposure to a judgment for its infringement has grown substantially (along with its sales and revenues from the infringing chips) during the laches period and that it simultaneously made significant capital expenditures in order to support its expanding business.”); *see also Crystal Semiconductor Corp.*, 246 F.3d at 1362 (“Crystal’s two year delay in initiating the present suit caused the damages owed by TriTech and OPTi to escalate. The record contains sufficient evidence for the district court to determine that Crystal’s delay was self-serving and resulted in prejudice to the defendants.”). Likewise, the requested prejudgment interest on this award has increased significantly because of the lengthy period of time wherein CMU took no affirmative action to protect its rights. *See id.* Despite these findings, the Court denied the laches defense due to Marvell’s willful infringement of the patented methods, sustaining approximately \$545 million of the jury’s verdict and one hundred

⁹ As noted in Table 2A to the Second Update to Expert Report of Catharine Lawton, the annual breakdown of royalties/damages is the following:

<u>Year</u>	<u>Amt (\$\$)</u>
2003	\$8,263,072
2004	\$41,515,659
2005	\$91,265,925
2006	\$117,234,916
2007	\$131,913,050
2008	\$145,030,763
2009	\$155,954,794
2010	\$181,314,415
2011	\$189,142,443
2012 (1/1 – 7/28)	\$107,505,236
Total	\$1,169,140,271

(Docket No. 634-1 at 5).

percent (100%) of CMU's claimed damages during the laches period. (Docket No. 920). Accordingly, CMU has been sufficiently compensated for its losses of the reasonable royalties through the jury's verdict¹⁰ and the award of supplemental damages, without the imposition of prejudgment interest as Marvell was prejudiced by CMU's delays, rendering this factor neutral. *See Feather*, 711 F.2d at 540.

The third factor examines whether the award would be compensatory in nature. The Court recognizes that it retains discretion to adjust the rate of prejudgment interest and to award same on all or part of the judgment award and to order that such interest be compounded or not. *See Uniroyal*, 939 F.2d at 1545. However, the potential size of any prejudgment interest award, e.g., those proffered by CMU, ranging from \$211 million to \$326 million, demonstrates that an award of prejudgment interest would represent an unearned windfall to CMU. (See Docket Nos. 788, 789, 852). In this Court's opinion, CMU's suggestion that it should be awarded "lost opportunity" damages it would have earned on royalties is undermined by evidence of its inactivity in response to allegations which should have caused it to investigate infringement, all of which the Court considered in the context of Marvell's laches defense. (*See* Docket No. 920). Again, CMU did not act like a reasonable patentee because it was unwilling to timely invest and pursue infringement allegations. The Court, thus, cannot conclude that it would have aggressively invested the royalties where the record overwhelmingly establishes that CMU had little interest in protecting the patents, despite repeated requests from the inventors. (*Id.* at 20-22). Further, although the approximately \$545 million in pre-suit damages are classified as compensatory in nature; this award was sustained *only* because of Marvell's willful infringement. (*Id.* at 68-72). Otherwise, the well-supported laches defense would have barred

¹⁰ The inventors will share in their portions of this award through their agreements with CMU wherein they are entitled to fifty percent (50%) of the damages obtained through this litigation, less costs and attorneys' fees. (Docket No. 671 at 194-195).

the claim for pre-suit damages. (*Id.*). Given same, any prejudgment interest added to that portion of the award (and the portion of prejudgment interest which is compounded against the escalating damages throughout the pendency of the lawsuit) would be, at least in part, punitive in nature. *See Humanscale Corp.*, 2010 WL 3397455, at *1 (citing *Gen. Motors Corp.*, 461 U.S. at 655). (Prejudgment interest is not punitive, thus “it must be applied only to the compensatory damages, not enhanced or other punitive damages.”). Accordingly, this factor weighs against awarding prejudgment interest.

The final factor for the Court’s consideration looks to the equities between the parties. But, the equities have already been fully examined by the Court in the context of the laches defense and such factors underlie the Court’s holdings above. (Docket No. 920). On balance, the Court believes that the pre-suit damages of approximately \$545 million should be awarded to CMU given Marvell’s willful infringement for the laches period, but an additional award of prejudgment interest added to the judgment award of \$1.249 billion, at any rate, compounded or not, is unwarranted due to CMU’s inexcusable and unreasonable delays in prosecuting this case and the prejudice to Marvell attendant to such delays.

For these reasons, CMU’s Motion [788] is denied to the extent that it seeks an award of prejudgment interest under 35 U.S.C. § 284.

C. Enhanced Damages

The Court now moves on to the issue of enhanced damages, which has become the “elephant in the room” between the parties. It remains contested on all fronts. (Docket Nos. 790, 793, 833, 850, 862). CMU seeks an unprecedented financial penalty against Marvell requesting that the Court impose a penalty of at least half a billion dollars and up to \$2.5 billion. (Docket No. 793). To this end, CMU advocates that the willful infringement by Marvell is

sufficient to justify a full trebling of damages in this case, (i.e., \$3,746,071,677), but, recognizing the scope of the damages award exceeding one billion dollars, alternatively contends that the Court should award enhanced damages in any of the following amounts: (1) double damages, (i.e., \$2,497,381,118); (2) double pre-suit damages, (i.e., \$1,803,240,562); or (3) double post-suit damages, (i.e., \$1,942,831,115).¹¹ (*Id.*). In opposition, Marvell initially maintains that enhanced damages are not appropriate but continues that if the Court should find its infringement willful and exercise its discretion to award enhanced damages, any enhancement should not exceed twenty percent (20%) of the damages award which would result in a total damages award of \$1,498,428,671. (Docket No. 834 at 24-25). Marvell suggests that such an award would be more appropriately tied to its level of culpability in this case. (*Id.*).

Section 284 authorizes the Court to award up to treble damages to a prevailing patentee. *See* 35 U.S.C. § 284 (“the court may increase the damages up to three times the amount found or assessed.”). An award of enhanced damages under section 284 is punitive in nature and awarded in the Court’s discretion. *See Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 37 (Fed. Cir. 2012) *cert. denied*, 133 S. Ct. 1291 (U.S. 2013) (“enhanced damages, however, are punitive, not compensatory, and can be awarded only in the judge’s discretion.”). The Court has already determined that Marvell wilfully infringed CMU’s patents in its prior decision of September 23, 2013, (*see* Docket No. 901), and this initial finding is sufficient to justify the imposition of a penalty of enhanced damages against Marvell, as the willful infringer. *See Whitserve*, 694 F.3d at 37 (quotation omitted) (“First, the fact-finder must determine whether an infringer is guilty of conduct upon which increased damages may be based. . . ., an act of willful infringement satisfies

¹¹ The Court notes that the specific penalty sought by CMU under each theory is:

- Treble Damages = \$2,497,381,118.00
- Double Damages = \$1,248,690,559.00
- Double Pre-suit Damages = \$545,550,003.00
- Double Post-suit Damages = \$694,140,556.00

th[e] culpability requirement and is, without doubt, sufficient to meet the first requirement to increase a compensatory damages award.”). The remaining decision for the Court requires the exercise of its sound discretion to determine “whether, and to what extent, to increase the damages award given the totality of the circumstances.” *Id.* (quotation omitted). To be clear, a finding of willful infringement does not necessitate the imposition of enhanced damages; however, after such a finding is made, the Court must explain its reasons for declining to award enhanced damages. *See id.* (“Upon a finding of willful infringement, a trial court should provide reasons for *not* increasing a damages award.” (emphasis added)).

The Federal Circuit has held that the *Read* factors, established in *Read Corp. v. Portec, Inc.*, 970 F.2d 816 (Fed. Cir. 1992), should be evaluated and weighed in determining whether damages should be enhanced under section 284. *Spectralytics, Inc. v. Cordis Corp.*, 649 F.3d 1336, 1348 (Fed. Cir. 2011). The *Read* factors are:

- (1) whether the infringer deliberately copied the ideas or design of another;
- (2) whether the infringer, when he knew of the other’s patent, investigated the patent and formed a good faith belief that it was invalid or that it was not infringed;
- (3) the infringer’s behavior in the litigation;
- (4) the infringer’s size and financial condition;
- (5) the closeness of the case;
- (6) the duration of the misconduct;
- (7) the remedial action by the infringer;
- (8) the infringer’s motivation for harm; and,
- (9) whether the infringer attempted to conceal its misconduct.

Id. Further, the “paramount determination in deciding to grant [an] enhancement and the amount thereof is the egregiousness of the defendant’s conduct based on all the facts and circumstances.”

Read, 970 F.2d at 826. Both parties have extensively considered the *Read* factors in their submissions as well as during oral argument. (Docket Nos. 790, 793, 833, 850, 862). As the parties have, the Court will address each factor, in turn. *Whitserve*, 694 F.3d at 37.

1. Deliberate Copying

Although a patentee is not required to present evidence that an infringer deliberately copied its invention in order to establish that its patent has been infringed, the first *Read* factor counsels that evidence of deliberate or intentional copying is one of the primary factors which must be considered by the Court to determine if damages should be enhanced under section 284. *See DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1336 (Fed. Cir. 2009) (Although evidence of copying is “of no import on the question of whether the claims of an issued patent are infringed,” it is a factor in determining enhanced damages). Evidence of deliberate copying by an infringer, among other factors, may justify an award of enhanced damages under section 284 because it demonstrates that the infringer had a culpable state of mind by acting wilfully and/or in bad faith toward the patentee’s rights. *See Jurgens v. CBK, Ltd.*, 80 F.3d 1566, 1571 (Fed. Cir. 1996); *see also nCube Corp. v. Seachange Intern., Inc.*, 436 F.3d 1317, 1325 (Fed. Cir. 2006) (affirming award of enhanced damages due, in part, to copying of the invention). In meeting this burden to show deliberate copying, the patentee is not required to prove that the infringer engaged in “slavish copying” or produced an infringing product which is an “exact copy” of the patentee’s product or used the patentee’s product as a template. *See Stryker Corp. v. Intermedics Orthopedics, Inc.*, 96 F.3d 1409, 1414 (Fed. Cir. 1996).

The parties’ positions as to whether the evidence presented at trial is sufficient to demonstrate conscious copying by Marvell were addressed by the Court in the context of its decision finding that the evidence supported a finding of willful infringement. (Docket No. 901 at 25-26, 66-83). To reiterate, CMU relies heavily on Dr. Stephen McLaughlin’s opinions that the technology was copied by Marvell in its simulators and chips and the jury’s finding that Marvell had the subjective intent to infringe without an objectively reasonable defense to

infringement. (*Id.*). Marvell counters that its engineers merely used publicly available information (i.e., the papers produced by Drs. Moura and Kavcic and the patents) in order to develop a suboptimal version of the patented methods which were allegedly too complex to implement in a detector and also claims that the simulators did not infringe the patents. (*Id.*).

After carefully considering the parties' arguments, the Court holds that the credible evidence presented at trial sufficiently establishes that Marvell deliberately copied CMU's Patents and such finding favors awarding enhanced damages to CMU. Again, the jury found that Marvell operated with the subjective intent to infringe CMU's Patents, had no objectively reasonable defense to the infringement, and as is explained in the following section, Marvell and its engineers were aware of CMU's Patents essentially upon their issuance. (Docket No. 762). Further, the Court has already determined that:

CMU presented evidence at trial showing that Marvell's engineers duplicated the technology described in Dr. Kavcic and Dr. Moura's papers in their chips and simulators, as testified to by Dr. McLaughlin. (Docket No. 677 at 54–55). The evidence shows that shortly after beginning work on the Kavcic model, Mr. [Gregory] Burd prepared a preliminary write-up of the KavcicPP detector which referenced the work of Dr. Kavcic and Dr. Moura. (Pl. Ex. 280). Again, Dr. McLaughlin testified that this KavcicPP write-up became the MNP circuit. (Docket No. 677 at 66–67). Although Mr. Burd stated that he was “generally following the papers,” not the patents, and that he “left it at that,” (*Id.* at 77), Dr. McLaughlin testified that the papers are virtually identical to what is described in the patents. (*Id.* at 66–67).

(Docket No. 901 at 82-83). In fact, Dr. McLaughlin credibly testified that the drawing in Gregory Burd's lab notebook was a “cut and paste” of Figure 3B of CMU's Patents. (Docket No. 677 at 106, Pl. Ex. 295).¹²

¹² The Court agrees with CMU's assessment that Dr. McLaughlin was not intensely cross examined on his technical opinions. (See Docket No. 793, n.20 (citing issues with Marvell's cross-examination of Dr. McLaughlin)).

The evidence also showed that when Kavcic's name was disassociated with the project, there was no functional difference between the old and new computer codes. (Pl. Ex. 368; Docket No. 677 at 81). Dr. [Zinning] Wu informed Mr. [Toai] Doan that he and Mr. Burd were working on a model that ended up being the original structure that Kavcic proposed in his paper. (Pl. Ex. 366; Docket No. 677 at 134–135). Dr. McLaughlin confirmed that the NLD used the original structure proposed in Dr. Kavcic's paper, and subsequently in the CMU Patents. (Docket No. 677 at 136–137).

(Docket No. 901 at 82-3). Thus, the record fully supports a finding that Marvell copied the patented technology.

As to the simulators, Marvell acknowledged that the IP taught in CMU's Patents is implemented by its Kavcic Viterbi simulator, (Docket No. 677 at 167), and that its employees considered this simulator to be the "gold standard" against which they continuously run tests, (*id.* at 55). Dr. McLaughlin testified that the other simulators likewise infringed the patents. (*Id.*). Considering this evidence, the jury decided affirmatively that Marvell deliberately and willfully infringed the patents in all of its simulators (i.e., Kavcic Viterbi, Kavcicpp, MNP, EMNP and NLD). (Docket No. 762). Given this admission and the jury's findings, CMU has submitted more than enough evidence of copying of the patents as exhibited through the operation of the simulators.

Additionally, the Court has rejected Marvell's argument that the alleged "sub optimality" of its solution to the media-noise problem was relevant to the infringement inquiry. (Docket No. 901 at 70). For the same reasons, such defense is likewise of no help to Marvell to defend against the claims that it copied CMU's Patents. (*Id.*). To this end, both parties' technical experts testified that suboptimal detectors were capable of infringing the patented methods¹³;

¹³ The Court previously recounted that:

Dr. McLaughlin explained that the difference between an optimal and suboptimal media detector relates to performance as measured by SNR [signal-

therefore, copying the methods for use in a suboptimal detector offers no defense to the charge of copying. (*Id.* at 75-76, n.82). But, more importantly, the facts adduced at trial demonstrated that Marvell knew that its MNP detector was not a suboptimal version of the patented methods, which it had claimed in its provisional patent application in 2002 and its '585 Patent. Again, Dr. Zining Wu wrote a year later in January 2003, that he and Mr. Burd had discussed the structure of the MNP chip enhancement and concluded that it “**turns out to be the original structure that Kavcic proposed in his paper.**” (Pl. Ex. 366 (emphasis added)). As noted in prior decisions, the MNP chip enhancement referred to in this email was later incorporated into all 2.3 billion of the MNP-type and NLD-type chips which the jury determined were infringed throughout the sales cycle and the hundreds of millions of additional infringing chips it has produced since the verdict. (Docket Nos. 762, 901, 920). In light of these facts, the evidence clearly supports the finding that Marvell copied the patented methods and incorporated same into its simulators and chips. Accordingly, such findings favor enhancing damages. *See Read*, 970 F.2d at 826.

2. Knowledge/Good Faith Belief of Non-Infringement/Invalidity

The second *Read* factor directs the Court to consider whether the infringer had knowledge of the patents, investigated same and developed a good faith belief that its activities were not infringing and/or that the patents were invalid prior to proceeding with its own products. *See id.* This factor is directly relevant to the underlying issue of willfulness and was exhaustively discussed in the Court’s September 2013 decision. (*See* Docket No. 901). For the

to-noise ratio] gain rather than infringement. (Pl. Ex. 279; Docket No. 677 at 64–65). In fact, he specifically stated that the suboptimal detector “would be using the same method” as the optimal noise detector, (Docket No. 677 at 65), and he has testified that the sub-optimal versions do infringe on CMU's patents. (*Id.*). Marvell's infringement expert, Dr. Proakis, similarly agreed that sub-optimality is not part of the infringement analysis.

(Docket No. 901 at 75).

reasons that were fully expressed in that decision, (*id.*), and consistent with the jury's verdict, (*see* Docket No. 762), the Court finds that Marvell had actual knowledge of CMU's Patents since at least January of 2002, and such patents were brought to its attention at several different points in time by a number of independent sources. Specifically,

- In January 2002, Mr. Burd sent two separate emails to his then-boss, Toai Doan, advising him of his work on the Kavcic method and pointing out that this work was patented by CMU, (Pl. Exs. 280, 283);
- In August 2003, CMU sent its "friendly letters" to high level Marvell personnel, i.e., former Chief Technology Officer Pantas Sutardja and former General Counsel Matthew Gloss, advertising the patents and asking that Marvell contact CMU to investigate a licensing agreement, (Pl. Exs. 422, 431); and,
- In November 2004, Fujitsu sent a letter to Marvell requesting an opinion on the scope of CMU's patents as compared to the read channel chips it was buying from Marvell at the time, (Pl. Ex. 477).

There is no evidence in the record that anyone at Marvell investigated the scope of the patents vis-à-vis its simulators or production of Accused Chips, including the simulators and detector (at least for a period of time) bearing Kavcic's name, in response to any of these communications. (Docket No. 901 at 69-70). At most, the evidence shows that Marvell forwarded the patents to its patent prosecution counsel and that the patents were cited as prior art in the provisional patent application and the '585 Patent which later issued. (*Id.* at 74, n.80). Marvell did not raise advice of counsel as a defense to CMU's willful infringement. As such, it has presented no evidence as to the scope of the investigation, if any, which was conducted by its attorneys and/or engineers (including the inventors of the '585 Patent, Dr. Wu and Mr. Burd). (*Id.*). In this Court's estimation, Marvell's suggestion that this process – forwarding the patents to an internal prosecution attorney and then adding a citation to same in its patent application – represents a

“public vetting” of the propriety of its activities is unreasonable and unsupported by the law. The record before the Court is undisputed that Marvell simply did not explore the scope of CMU’s Patents; proceeded to run simulators and sell 2.3 billion Accused Chips (and counting) copying and/or closely modeling products after the inventors’ work.

Marvell’s inaction resulted in its failure to develop any infringement and/or invalidity defenses until after this litigation was commenced and its litigation defenses were only mildly successful. (See Docket Nos. 13, 116). It is true that the Court granted summary judgment in Marvell’s favor on the Group II claims which were asserted by CMU, (Docket No. 443), and commented that it was a “close call” in denying summary judgment on the Group I claims, (Docket Nos. 306, 337), but two of the Group I claims were presented to the jury at trial, (i.e., claim 4 of the ‘839 Patent and claim 2 of ‘180 Patent), and the jury found in favor of CMU on all issues of infringement, invalidity and damages, (Docket No. 762). In light of the jury’s verdict, particularly the damages award which, as supplemented, is now in excess of \$1.248 billion, Marvell’s partial summary judgment victory can hardly be characterized as truly successful.

To conclude, analysis of this second *Read* factor weighs strongly in favor of awarding enhanced damages to CMU.

3. Infringer’s Behavior in the Litigation

The third *Read* factor involves an examination of whether the infringer engaged in “litigation misconduct” during the pendency of the case. *Read*, 970 F.3d at 827. The Federal Circuit has held that “[t]ypically, ‘litigation misconduct’ refers to bringing vexatious or unjustified suits, discovery abuses, failure to obey orders of the court, [...] acts that unnecessarily prolong litigation,” or direct violations of court orders by counsel. *i4i Ltd. Partnership v. Microsoft Corp.*, 598 F.3d 831, 859 (Fed. Cir. 2010) (citing *Jurgens*, 80 F.3d at

1570–71 & n. 3; *Va. Panel Corp. v. MAC Panel Co.*, 133 F.3d 860, 866 (Fed. Cir. 1997)). While “litigation misconduct” is properly considered as part of the analysis of the *Read* factors; such misconduct is not sufficient to provide an independent basis to enhance damages under section 284. *See i4i Ltd.*, 598 F.3d at 859.

CMU argues that Marvell has taken actions for the primary purpose of unnecessarily increasing the burden of this litigation, by, among other things, presenting defenses at trial based on contradictory testimony, disavowing its contemporaneous documents on its prior non-infringement and invalidity positions, and engaging in excessive motions practice on unmeritorious issues. (Docket Nos. 792-93, 850).¹⁴ In opposition, Marvell counters CMU’s individual arguments and points to instances of supposed litigation misconduct by CMU’s counsel during the case. (Docket Nos. 832-33, 862). Marvell’s counsel further suggests that their advocacy – like that provided by their opponents for CMU – was undertaken only in zealous representation of their clients’ interests. (*Id.*).

Having presided over this matter from the outset, and after fully considering the conduct of the parties and their attorneys throughout this case, the Court finds that the third *Read* factor is neutral. It does not support an award of enhanced damages. This is “high stakes” litigation involving two sophisticated parties represented ably by highly capable and qualified counsel. The parties have steadfastly remained very far apart in their respective evaluations of the merits of this case as to both liability and damages,¹⁵ (i.e., \$250,000 v. in excess of \$1 billion), causing

¹⁴ CMU makes similar arguments in support of its Motion for Attorney’s Fees, (Docket No. 791), which the Court has denied, without prejudice, given Marvell’s expressed intent to appeal this matter. (*See* Docket No. 884).

¹⁵ The Court has repeatedly noted the parties’ inability to effectively mediate this case and the numerous methods and professionals (including the undersigned, former Magistrate Judge Infante and others) who were engaged in various attempts to have the parties bridge the gap and successfully negotiate the matter. (*See* Docket Nos. 901 at n.124; 920 at n.48). While these efforts were unsuccessful, there has never been a motion from an opposing party claiming bad faith mediation practices under § 2.4 of this Court’s ADR Practices and Procedures. Hence, there has been no adjudication that either of the parties engaged in bad faith during this process. *See ADR Policies and Procedures of the United States District Court for the Western District of Pennsylvania*, § 2.4 (effective

the litigation to be very contentious at times. Certainly, this case required an inordinate amount of the Court's time umpiring discovery disputes, deciding numerous pretrial motions brought by both parties on dispositive and non-dispositive issues, refereeing countless evidentiary objections and motions during the trial and now finally resolving the balance of the post-trial motions.¹⁶ (See Docket No. 901). But, neither the parties nor their counsel were sanctioned by the Court during the case, perhaps because of the Court's active case management and willingness to engage the parties and resolve all of their aforementioned disputes. (See Docket Report, Civ. A. No. 09-290). In any event, while the Court has questioned the methods of both sides on occasion, rightly or wrongly, neither side crossed the proverbial line between zealous advocacy and engaged in the types of litigation misconduct which the Federal Circuit counsels would be properly considered in support of an award of enhanced damages under section 284. Accordingly, the Court finds that this factor is neutral and does not serve as a basis for enhanced damages.

4. Infringer's Size and Financial Condition

The next issue for discussion given the fourth *Read* factor is whether the infringer's size and financial condition are sufficient to support an award of enhanced damages. *Read*, 970 F.3d at 827. While recognizing that enhanced damages are imposed to punish the infringer as well as to deter infringing behavior, courts examine the infringer's size and financial condition to determine if an award of treble damages would "severely prejudice" its business. *See Univ. of Pittsburgh of Com. Sys. of Higher Educ. v. Varian Med. Sys., Inc.*, Civ. A. No. 08-1307, 2012 WL 1436569, at *7 (W.D. Pa. Apr. 25, 2012) (Schwab, J.). In some instances, an infringer's

Feb. 1, 2012), available at: https://www.pawd.uscourts.gov/Applications/pawd_adr/Documents/ADRPolicies.pdf (last visited 3/27/14).

¹⁶ Here the Court would note it has been hampered by the loss of three active District Judges in the past year, resulting in a larger civil case load and the highest individual criminal case load in the Pittsburgh division.

financial condition is cited as a reason not to grant enhanced damages to the fullest extent if the infringer is in a weak financial position. *See, e.g., Funai Elec. Co., Ltd. v. Daewoo Elecs. Corp.*, 593 F. Supp. 2d 1088, 1115 (N.D. Cal. 2009) (noting that infringer was in a weak financial position and did not support award of damages), *aff'd*, 616 F.3d 1357, 1376–77 (Fed. Cir. 2010). Other cases recognize that this factor supports the enhancement of damages against a financially strong infringer which is easily able to withstand an award of treble damages. *See e.g., i4i Ltd.*, 598 F.3d at 858 (noting that the infringer, Microsoft, was undisputedly the world leader in software business and computers, with more than \$60 billion in revenues in 2008 and could easily withstand a penalty of up to \$600 million in damages, if trebled).

At the outset, the Court points out that CMU has set forth seemingly contradictory positions vis-à-vis the strength of Marvell’s financial condition, undermining its arguments that this factor supports an enhancement. As support for its requests for enhanced damages and an ongoing reasonably royalty of \$1.50 per Accused Chip, CMU claims that Marvell has a strong financial position, as exhibited in financial statements which it has presented and the sales information submitted at trial and adds that Marvell has made certain public comments that its business will not be disrupted as a result of the verdict. (Docket No. 793 at 21). On the other hand, in CMU’s pursuit of a preliminary injunction, and later motions to register and execute on the judgment, it suggests that Marvell is a “collection risk” due to its business structure and purported intentional dissipation of its liquid assets in order to avoid a judgment. (Docket Nos. 787, 853, 908-09). From its perspective, Marvell denies that it is a “collection risk” but also maintains that its financial condition, while sound, could not support an award of trebling the jury’s substantial verdict in this case. (Docket Nos. 833, 862).

The Court agrees with Marvell that its business appears to be doing very well at present. The Court, however, does not believe that Marvell is sufficiently capitalized to withstand a penalty of treble or even double damages creating an additional penalty of \$2,497,381,118 or \$1,248,690,559, on top of the billion dollar award in this case. Marvell is a publicly traded company with its shares traded daily on the NASDAQ Global Select Market under the symbol “MRVL.”¹⁷ (*See* 10-K, Docket No. 909-3 at 52). One of the many ways to value a publicly traded company is to look to its market capitalization, which “is measured by multiplying its stock price by the total number of shares it has issued.”¹⁸ *Alco Ind., Inc. v. Wachovia Corp.*, 527 F. Supp. 2d 399, n.4 (E.D. Pa. Nov. 5, 2007) (citation omitted). Market capitalization is often used by courts to value businesses because, absent evidence to the contrary, the public markets generally produce an impartial and unbiased valuation of a company. *Cf. Iridium Operating LLC v. Motorola, Inc.*, 373 B.R. 283, 293 (Bankr. S.D.N.Y. 2007) (recognizing that “the public trading market constitutes an impartial gauge of investor confidence and remains the best and most unbiased measure of fair market value and, when available to the Court, is the preferred standard of valuation”). A company’s market capitalization fluctuates daily because it is tied to the company’s stock price, which changes based on a substantial number of different factors, including the financial performance of the business, trading volumes and prices, financial forecasts by analysts, litigation risks and other external market forces. *Id.*

¹⁷ Like all publicly traded companies, Marvell is required to make periodic filings with the Securities and Exchange Commission (“SEC”), and several of these SEC filings have been submitted for the Court’s review. (*See e.g.*, Docket No. 909-3).

¹⁸ The market valuation of a company is typically used to categorize it as a large-cap, mid-cap or small-cap company, although the precise values for each category varies considerably between funds and other sources. *See Alco, Ind., Inc.*, 527 F. Supp. 2d at n.4. NASDAQ defines large-cap stocks as those companies with a market capitalization of over \$5 billion and mid-cap stocks as those companies with a market valuation between \$1 billion and \$5 billion. *See NASDAQ*, large-cap definition, available at: <http://www.nasdaq.com/investing/glossary/l/large-cap> and mid-cap definition, available at: <http://www.nasdaq.com/investing/glossary/m/mid-cap> (last visited 3/24/14). Other indexes and funds use different ranges to determine whether the companies are categorized as large-cap, mid-cap or small-cap. *See Alco, Ind., Inc.*, 527 F. Supp. 2d at n.4. As noted, during the pendency of this case, Marvell’s market capitalization has fluctuated between the ranges for mid-cap and large-cap companies.

Here, the record evidence before the Court indicates that Marvell's market capitalization is presently in excess of seven billion dollars. (Docket No. 927 at 2). This valuation has, however, fluctuated greatly during the pendency of this litigation, most notably via an immediate decrease in value following the jury's verdict in this case. (*See* Docket No. 908-4 at 2-3 (Marvell's "[s]hares tumbled late in 2012, when a federal jury in Pittsburgh ordered the company to pay a \$1.17 billion award for infringing Carnegie Mellon patents covering integrated circuits.")). After the jury's verdict on December 26, 2012, Marvell's stock price fell to a low of \$6.98 per share at its lowest point resulting in an approximate market capitalization of around \$3.4 billion dollars. (*See* Docket No. 912-2 at 2). By November 2013, the market capitalization had rebounded to approximately \$5.9 billion. (Docket No. 908-4 at 2-3). On December 16, 2013, after the public announcement of a significant acquisition of Marvell stock by Kohlberg Kravis Roberts & Co., LP., the market capitalization became \$6.8 billion. (Docket No. 912-2). Since then, Marvell's market capitalization has steadily increased to the present valuation of over seven billion dollars. (Docket No. 927 at 2).

The parties have additionally provided the Court with information concerning Marvell's liquid assets, including its cash, cash equivalents, restricted cash and short term investments, but such figures are likewise dynamic, changing over time. (*See* Docket No. 909-2, Table titled, "Marvell's Cash v. "But for" Cash without SPR & Div"). In February of 2013, around the time of the entry of judgment in this case, Marvell maintained approximately \$2 billion in these liquid assets, causing CMU to proclaim that it was "flush with cash" and able to pay an ongoing running royalty of \$1.50 per chip. (Docket No. 787 at 3). But, Marvell's liquid assets have changed over time due to its ongoing business operations, including a share repurchase program, through which Marvell has set out to repurchase up to \$3 billion in stock over the past few years

while the litigation was pending. (*See* Docket No. 909-3).¹⁹ CMU roundly criticized Marvell's continuation of its share repurchase program after the verdict, but Marvell reports that such program was instituted years before the award and has now substantially concluded. (*See e.g.*, Docket No. 909). Even with these repurchases, the latest financial information provided to the Court indicates that Marvell maintains around \$1.8 billion in liquid assets and CMU's own expert forecasts that it will maintain around \$2 billion in same throughout this fiscal year. (*See* Docket No. 909-2 at 2).

The Court is also cognizant of the exceptional revenues generated by Marvell through its sales of Accused Chips containing the infringing methods. Before trial, this figure was approximately \$10.3 billion and due to continuing sales, (Docket No. 634-1 at 3, 8), the total revenue figure now exceeds \$12 billion, (Docket No. 907). Again, these figures grew because of CMU's failure to meaningfully investigate the infringement allegations asserted by the inventors during the period of time where Marvell's sales were not as robust.²⁰ (*See* Docket No. 920).

¹⁹ Marvell's 10-K Report explains this program, as follows:

In August 2010, our board of directors initially authorized our current share repurchase program to repurchase up to \$500 million of our outstanding common shares. During fiscal 2012, our board of directors authorized an additional \$1.5 billion to be used to repurchase our common shares under the share repurchase program. In May and December 2012, we announced additional increases of \$500 million to the share repurchase program. This increases the total available under the repurchase program to \$3.0 billion. We intend to effect the repurchase program in accordance with the conditions of Rule 10b-18 under the Exchange Act. The repurchase program will be subject to market conditions and other factors and does not obligate us to repurchase any dollar amount or number of our common shares. The repurchase program may be extended, modified, suspended or discontinued at any time. We may make repurchases in open market or privately negotiated transactions in order to effect our repurchases.

(Docket No. 909-3 at 54).

²⁰ For example, through 2005, when CMU had already been told by Dr. Kavcic that Marvell was making chips "exactly" as claimed in the patents, had named a subroutine in the detector after him, and demanded that CMU file a lawsuit, and Marvell's '585 Patent, citing CMU's Patents as prior art, had already issued, Marvell had sold only 282 million chips resulting in \$141 million in royalties. (*See* Docket Nos. 920; 634-1 at 5, Lawton, "Table 2A"; and n.9, *supra*).

CMU likewise points to Marvell's overall profits from the sales of the infringing chips, which it values at over \$6 billion. (Docket No. 907). However, its expert on damages, Ms. Lawton valued the infringement in this case based on an "excess profits" analysis wherein she specifically opined as to the added financial value of the patented methods to the Accused Chips and priced the reasonable royalty at \$0.50 per chip based on her belief that the parties would negotiate a reasonable royalty at that rate.²¹ (See Docket No. 901 at 114-15). She also opined that the total "excess profits" attributable to Marvell's additions of the patented methods to its chips was the ultimate damages figure of \$1.169 billion based on the \$0.50 royalty rate because the patented methods were "must have" for Marvell and its customers. (Docket No. 634-1). So, the damages award reflects the fact that Marvell has already been disgorged of the percentage of profits that CMU's own expert attributed to the inclusion of the patents in Marvell's products.²²

In all, the Court believes that a penalty of treble or double damages which would increase the judgment to approximately \$3.7 billion or \$2.5 billion would "severely prejudice" Marvell's business. See *Varian Med. Sys., Inc.*, 2012 WL 1436569, at *7. Such a significant penalty would effectively value the infringement at a rate of nearly fifty percent (50%) or one-third (33%) of the current market capitalization of the entire company. Based on the historical data of the stock price and the decline of same when the jury's verdict of \$1.169 billion was announced, the Court can logically infer that the stock price and market capitalization would again decrease if such a significant penalty was imposed, and the judgment debt would then hold an even greater percentage of the total value of the company. Indeed, if the stock price returned to its low price in December 2012, trebling damages would exceed the market capitalization of the company, which was then at approximately \$3.4 billion. (See Docket No. 912-2 at 2). Further,

²¹ Again, Marvell did not specifically counter these opinions through a rebuttal expert.

²² The Court also considers this factor in imposing an ongoing royalty for the continuing infringement. See § IV.B., *infra*.

the imposition of a penalty based on either trebling or doubling damages would place Marvell in a financial position where the judgment debt owed to CMU would likely exceed its current liquid assets of approximately \$1.8 billion. (*See* Docket No. 909-2). While such an exceptional award may lend credence to CMU’s “collection risk” theory, by possibly requiring Marvell to incur debt, issue additional equities or engage in some type of other financial maneuvers in order to satisfy the judgment, this type of penalty would likely “severely prejudice” Marvell’s ongoing operations, including its many non-infringing business lines.

For these reasons, the Court finds that Marvell’s financial condition does not support an enhancement and strongly counsels against enhancing damages to the degree requested by CMU.

5. Closeness of the Case

The next *Read* factor is whether the case was “close,” on which of course the parties disagree. *Read*, 970 F.3d at 827. The Court’s inquiry under this factor requires it to weigh the strength of the parties’ evidence on the disputed issues in the case. *See Mentor H/S, Inc. v. Medical Device Alliance, Inc.*, 244 F.3d 1365, 1380 (Fed. Cir. 2001); *see also Spectralytics, Inc. v. Cordis Corp.*, 2011 WL 60003931, at *5-6 (D. Minn. 2011). In evaluating this factor, the Court looks to its prior rulings on dispositive motions, the strength of the evidence presented at trial and the jury’s verdict. *See e.g., id.; SSL Servs., LLC v. Citrix Sys., Inc.*, 2:08-CV-158-JRG, 2012 WL 4092449 (E.D. Tex. Sept. 17, 2012) (Court held that the case was not a close call as the jury had deliberated for 3 hours and awarded Plaintiffs the precise amount presented to the jury by SSL’s damages expert and asked for by SSL in its closing arguments.); *Wordtech Sys., Inc. v. Integrated Network Solutions, Inc.*, 204-CV-01971-MCE-EFB, 2009 WL 113771 (E.D. Cal. Jan. 15, 2009) (“the evidence presented at trial overwhelmingly favored a finding for Plaintiff, as is

evidenced by the relatively short deliberations required for the jury to reach a unanimous verdict on all causes of action.”).

At the outset, the Court agrees generally with CMU’s position that the jury’s verdict is reflective of the jury’s view that the case was not close. Indeed, the jury found in favor of CMU on every issue presented to it and awarded the precise amount of damages requested by CMU. *See id.*; (Docket No. 762). Yet, the Court must also look beyond the jury’s verdict to determine whether, and to what extent, the case presented close issues.

For all of the reasons that have been previously expressed, the Court does not believe that the issues of infringement or willfulness were close as CMU’s trial presentation on these issues was very strong and having addressed these matters at length, the Court will not belabor those points. (*See also* Docket No. 901). The Court acknowledges that it stated in ruling on the motion for summary judgment on invalidity issues that it was a “close call”; however, such ruling merely denied a summary judgment motion and permitted that aspect of the case to be decided by the jury. (Docket Nos. 306, 337). While the Court believes that the invalidity defense was likely Marvell’s strongest, the jury disagreed and presumably found Dr. McLaughlin’s opinions to be more credible than those put forth by the defense expert, Dr. John Proakis. Having presided over the trial, and heard all of the parties’ evidence, the Court agrees with that assessment. (*See* Docket No. 901 at 52-66). Accordingly, the invalidity issue was not sufficiently close at trial to weigh in Marvell’s favor in the Court’s analysis of the *Read* factors.

On the other hand, Marvell’s challenges to the admission of non-U.S. sales as part of the royalty base, its motions contesting pre-suit damages under both the marking statute and the doctrine of laches were all close. (Docket Nos. 595, 672, 920). The Court also heavily

scrutinized the reasonable royalty opinion of CMU's damages expert, Lawton, as has been discussed at length above. (Docket Nos. 451, 713, 901).

Although the Court ruled in CMU's favor on the balance of these issues and continues to believe that those decisions are correct, the Court recognizes the significance of same on the damages evidence CMU was permitted to present to the jury and the ultimate jury verdict. To this end, the Court precluded CMU from recovering pre-suit damages as to the '839 Patent under the marking statute, 35 U.S.C. § 287. (Docket No. 595). The Court carefully examined the pre-suit conduct of both parties as to the '180 Patent but ultimately upheld the jury's award of \$545 million in damages for this period of time. (Docket No. 920). The Court also acknowledged that CMU's "but for" causation theory permitting Marvell's use of the infringing simulators during the U.S.-based sales cycle to capture all of Marvell's sales was "novel," but permitted this theory to be presented to the jury. (Docket No. 672). A ruling for Marvell on this issue would have significantly lowered the royalty base presented to the jury (for the time period of March 6, 2003 to July 28, 2012) to 556,812,092 and consequently, reduced the recoverable damages available to CMU to only \$278,406,046. (Docket No. 633-1 at 7). With that said, the Court emphasizes that its findings made in its September 2013 decision on the JMOLs that despite Marvell's pretrial posture, it did not factually prove at trial that its sales were made outside the United States. (Docket No. 901 at 96-105). Further, as noted, Marvell offered no real counter evidence to challenge Ms. Lawton's carefully crafted damages opinion on the reasonable royalty. (*Id.* at 89). Instead, Marvell put forth Creighton Hoffman and his rather cursory opinion that the royalty agreement would have been a one-time, lump sum payment of \$250,000.00. (*Id.* at 89 (citing (Docket No. 709 at 242-245))). In light of all of these rulings, the jury was tasked with weighing

a \$1.169 billion valuation versus a \$250,000.00 valuation. (*Id.*). Although it was certainly permitted to award an intermediate verdict, it chose not to do so.

To conclude, the evidence on liability strongly favored CMU's positions but the case certainly presented "close calls" for the Court on damages which appear to be ripe for decision by an appellate court. As the present discussion concerns the extent of a financial penalty to be imposed on top of the significant damages which have already been awarded, the Court does not believe that the fifth *Read* factor favors an enhancement.

6. Duration of the Misconduct

The sixth *Read* factor examines the duration of the misconduct by the infringer, which may be weighed against any delays in prosecution by the patentee. *Read*, 970 F.3d at 827. It is also well recognized that delays which are insufficient to demonstrate laches, may still be relevant to this factor. *Mass Engineered Design, Inc. v. Ergotron, Inc.*, 633 F. Supp. 2d 361, 391 (E.D. Tex. 2009). The Court has exhaustively discussed its evaluation of the evidence as to CMU's delays and Marvell's long and sustained willful infringement of the patented methods in the context of its laches decision, (Docket No. 920), and in § II above regarding the claim for prejudgment interest.

On balance, after again weighing these facts, the Court holds that the sixth *Read* factor does not support an enhancement to the extent advocated by CMU and further notes that an appropriate adjustment will be made to the overall award of enhanced damages due to the fact that CMU's pre-suit damages claim was sustained only as a result of Marvell's willfulness. Further explanation of these calculations is set forth in § II.C.10 below.

7. Remedial Action by the Infringer

The seventh *Read* factor requires the Court to evaluate the remedial action taken by the infringer, if any. *Read*, 970 F.3d at 827. Courts look to any remedial action by the infringer in determining whether to enhance damages because “patent infringement is a continuing tort, and an action even if innocently begun does not automatically retain its purity as circumstances change. The filing of a lawsuit does not stop the clock insofar as culpability may arise from continuing disregard of the legal rights of the patentee.” *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1221-22 (Fed. Cir. 1995). To this end, actions by the infringer to remediate the alleged infringement may undermine a claim for willfulness and/or counsel against awarding enhanced damages, through such activities as: discontinuation of product lines allegedly infringing; investing in a redesign of the allegedly infringing products; and/or negotiating with the patentee in good faith to avoid infringement. *See e.g., Trading Technologies Intern., Inc. v. eSpeed, Inc.*, 595 F.3d 1340, 1358 (Fed. Cir. 2010) (“Prompt redesign efforts and complete removal of infringing products in a span of a few months suggest that eSpeed was not objectively reckless.”); *Amstar Corp. v. Envirotech Corp.*, 823 F.2d 1538, 1546-47 (Fed. Cir. 1987) (infringer obtained an opinion of counsel and attempted to design around the product and also negotiated with patentee in good faith during this process); *Pall Corp.*, 66 F.3d at 1221-22. In contrast, conduct by the infringer throughout the litigation which shows a disregard for the patentee’s credible claims often is found to support enhancing damages, including: failing to obtain an opinion of counsel; ramping up production of new products despite the allegations; and continuing to infringe after a finding of willfulness. *See e.g., SynQor, Inc. v. Artesyn Tech., Inc.*, 709 F.3d 1365, 1385 (Fed. Cir. 2013) (post-verdict infringing sales supported enhancement); *Power Intergrations, Inc. v. Fairchild Semiconductor Intern., Inc.*, 725 F. Supp. 2d 474, 480 (D. Del. 2010), *rev’d on other grounds*, 711 F.3d 1348 (Fed. Cir. 2013).

The parties once again dispute the import of this *Read* factor. (Docket Nos. 793, 833, 850, 862). CMU suggests that Marvell's lack of any remedial action to avoid infringement until months after the billion dollar verdict in this case fully supports enhancing damages. (Docket Nos. 793, 850). CMU further points out that Marvell not only continued to infringe during the pendency of this lawsuit through known product lines but actually introduced at least 17 new product lines containing the infringing technology. (*Id.*). Marvell challenges these assertions, trumpets that its actions were reasonable and maintains that as of July, 2013, it had moved to design around the patents. (Docket Nos. 833, 862).

After considering all of the evidence of record as well as the parties' arguments, the Court agrees with CMU that this seventh *Read* factor supports an award of enhanced damages because Marvell has acted with a complete disregard for CMU's patent rights throughout this case. The Court initially looks to the numerous opportunities which Marvell had to conduct a pre-suit investigation and evaluate whether its simulators and products infringed. Instead, Marvell simply ignored inquiries from CMU and its own customer, Fujitsu, to evaluate the claims in CMU's Patents. (Pl. Exs. 422, 431, 477). When CMU finally brought this suit in 2009, it affirmatively put Marvell on notice of its claims that Marvell was wilfully infringing its Patents. (Docket No. 1). Moreover, the Court made a number of rulings that put Marvell on notice of the potential scope of this case, when it construed the claims on October 1, 2010, (Docket No. 176), and in numerous decisions on summary judgment motions in 2012. (Docket Nos. 306, 337, 423, 441, 443, 445, 447, 449, 451). Yet, Marvell has continued to unabashedly infringe the patented methods through its existing chip lines. And, as noted above, it also added the challenged technology to new product lines which were not even created until after the lawsuit was filed. (*See* Docket No. 850 at 7). Marvell further points to its lengthy sales cycle

and proffers that it was not cost effective to redesign the chips including the patented methods which were in process. (Docket Nos. 833, 862). However, the length of the sales cycle provides no explanation for the production of these additional lines of chips containing the infringing technology which were later introduced. So, these arguments are granted little weight.

The Court recognizes that Marvell has consistently taken a “no liability” position throughout this case but it also exhibited no interest in even attempting to design around the patented methods until very recently. It took this position despite arguing to the jury that the patents were essentially worthless and unnecessary to the success of the products.²³ (Docket No. 707 at 59-62). Pursuant to a joint status report from the parties, Marvell only actively started to attempt to design around the accused methods in July of 2013 – seven months after the verdict. (Docket No. 898). According to Marvell, its redesign (of its C11000 chips) will not include the NLD but will not be in volume production until the end of 2014, at the earliest. (Docket No. 833 at 23). It is, therefore, wholly unreasonable that Marvell took no remedial action until months after the billion dollar verdict in this case and the jury’s finding of willful infringement. (Docket No. 793 at 22).

Marvell’s complete disregard of CMU’s patent rights is best exemplified through its post-trial affidavit of Dr. Wu, who stated that Marvell would discontinue its inclusion of the infringing technology in its MNP and NLD products but only after CMU obtained a judgment against Marvell. (Docket No. 802 at Ex. 2). As this Court has recognized, Marvell always knew what it was doing and deliberately took on both the business and legal risk to continue infringing until it was ordered by the Court to discontinue. (Docket No. 920). To Marvell, the

²³ At trial, Marvell claimed to have several other technologies that could offer the same benefits as the MNP and NLD (Docket No. 707 at 59-62), yet Marvell has not replaced the MNP or NLD with any of them in the past four years. In fact, CMU identified 17 Marvell infringing chips that were developed at least a year after the lawsuit was filed. (Docket No. 850 at 7).

risk was worth the reward of billions of dollars of revenues and profit obtained throughout this case and continuing through post-trial infringement. Marvell has also consistently maintained that it will appeal every adverse decision this Court has rendered, along with the jury's verdict and the judgment. But "the Court is 'not directed to evaluate defendant's appellate position. Instead, the Court is told to determine whether remedial actions have been taken.'" *Varian*, 2012 WL 1436569, at *7 (quoting *Muniauction, Inc. v. Thomson Corp. and i-Deal, LLC*, 502 F. Supp. 2d 477 (W.D.Pa.2007) (Lancaster, J.), *rev'd on other grounds*, 532 F.3d 1318 (Fed. Cir. 2008)). The remedial actions taken by Marvell here are simply "too little, too late" in order to avoid the penalty of enhanced damages.

For these reasons, the Court finds that Marvell's lack of any remedial action prior to July 2013 supports an enhancement under section 284.

8. Infringer's Motivation for Harm

The Court next looks to evidence of the infringer's motivation for harm toward the patentee. *Read*, 970 F.3d at 827. This eighth *Read* factor typically favors enhanced damages when the patentee is a direct competitor of the infringer and the infringement is used and designed to harm the competition. *See e.g., Odetics, Inc. v. Storage Tech. Corp.*, 14 F. Supp. 2d 800, 804 (E.D. Va. 1998) *aff'd*, 185 F.3d 1259 (Fed. Cir. 1999); *Parker-Hannifin Corp. v. Wix Filtration Corp.*, Civ. A. Nos. 1:07-cv-1374, 1:07-cv-1375, 2011 WL 976559, at *17 (N.D. Oh. Mar. 17, 2011) (noting that patentee and infringer were fierce competitors and each were vying for GM's business); *K-TEC v. Vita-Mix*, Civ. A. No. 2:06-cv-108-TC, 2011 WL 285699, at *4-6 (D. Utah Jan. 26, 2011) (patentee and infringer were direct competitors and infringer was seeking to prevent customers from purchasing products from patentee). Absent such direct

competition between the parties, this eighth *Read* factor does not support enhancing damages. *Id.*; see also *Varian*, 2012 WL 1436569, at *7.

The evidence is uncontested that Marvell and CMU are not competitors as CMU is a university that does not practice the methods of the patents or manufacture any products while Marvell is arguably the market leader in its chip manufacturing business. See *Varian*, 2012 WL 1436569, at *7 (“The parties in this case were not direct business competitors, because Pitt, as an educational and research institution, has not made or marketed products resulting from its efforts.”). Further, the evidence is clear that CMU has not entered into an affirmative license for the patents-in-suit with any of Marvell’s competitors such that it could be reasonably argued that its willful infringement was designed to harm CMU’s licensees. Indeed, at least one of Marvell’s customers, Seagate, has a royalty-free license to use the patents through its DSSC partnership with CMU and it has purchased millions of infringing chips from Marvell. (See Docket No. 920). Additionally, Dr. Kavcic advised CMU that he was told that several other chip manufacturers (e.g., Hitachi, Agere, and ST Microelectronics) were likewise infringing the methods, yet CMU has not pursued those entities for patent infringement, to this Court’s knowledge. (Def. Ex. 212). In all, the record demonstrates that Marvell’s motivation for its willful infringement of the patented methods is the singular pursuit of profit rather than to directly harm CMU. See *Varian*, 2012 WL 1436569, at *7. Accordingly, this factor is neutral in regards to enhanced damages.

9. Attempt to Conceal Misconduct

The last *Read* factor for the Court’s consideration is whether there is evidence that the infringer attempted to conceal its misconduct. *Read*, 970 F.3d at 827. In evaluating this factor, courts look to a number of facts, including: misleading communications to the patentee about the

scope of the products; advertising or selling the products covertly; or concealing evidence of misconduct. *See e.g., Minks v. Polaris Industries, Inc.*, No. 6:05-cv-1894-Orl-31KRS, 2007 WL 788418, at *1 (M.D. Fl. Mar. 14, 2007), *aff'd, in part, rev'd in part, on other grounds*, 546 F.3d 1364 (Fed. Cir. 2008); *Varian*, 2012 WL 1436569, at *7; *PACT XPP Technologies, AG v. Xilinx, Inc.*, Civ. A. No. 2:07-CV-563-RSP, 2013 WL 4801885, at *3 (E.D. Tex. Aug. 30, 2013). In contrast, open activities by the infringer may counsel against the award of enhanced damages. *See Odetics, Inc.*, 185 F.3d at 1274 (noting that infringer did not attempt to conceal its activities).

The parties' disputes as to this factor raise similar points which have been addressed by the Court in other contexts. CMU suggests that this factor favors its position because of Marvell's "policy of secrecy" enveloping its confidential circuitry designs and failure to respond to communications about the patents from its Technology Transfer Office and Fujitsu. Marvell counters that confidentiality is necessary to protect its trade secrets and proprietary technology and once again, relies on its '585 Patent to demonstrate its claimed open and good faith actions.

In this Court's estimation, this factor slightly favors an enhancement because the evidence is somewhat mixed. To this end, although there is certainly evidence of Marvell's secrecy, CMU was aware of the willful infringement from very early on but failed to meaningfully investigate the inventors' allegations and despite its communications to Marvell in August of 2003, it never followed up on alleged infringement. (*See* Docket No. 920). It is true that there is robust evidence in the record demonstrating that Marvell is extremely secretive with both its business practices and chip circuitry designs and essentially sells all of its products in a manner to avoid them being reverse-engineered. (*See e.g.*, Docket No. 707 at 55 (Dr. Sutardja testifying that Marvell and its employees are "extremely paranoid people"); (Docket No. 709 at 61–64) (Dr. Wu testifying that "[j]ust like Coca-Cola keeps its formula as a secret ... For you to

understand how the circuits implemented, the implementation detail, yes, you do need to talk to our people.”)). But, there is no evidence that Marvell’s policies kept CMU from learning of the infringing activities. (*See* Docket No. 920). Indeed, Dr. Kavcic learned in 2003 that Marvell was infringing the patented methods and in 2004, that Marvell had products named after him. (Def. Exs. 212, 246, 266; Docket Nos. 816-1 at 4; 816-4 at 10-12). He also became aware of Marvell’s ‘585 Patent in early 2006. (Docket No. 674 at 220-21). He then promptly and timely provided all of the information he gathered to CMU. (*Id.* at 108-110). If anything, CMU was dissuaded from investigating infringement by Dr. Mark Kryder and Seagate and it never changed its position until 2008. (Def. Ex. 213).

The Court has also discussed the import of the “friendly letters” *ad naseum*. (Docket Nos. 901, 920, § II.B., *supra*). Again, there is no evidence that Marvell mislead CMU because it simply did not respond to the letters or the inquiry from Fujitsu. (Pl. Exs. 422, 431, 477). But, there is also no evidence that anyone at Marvell considered the import of the letters when its executive team, engineers and in-house counsel clearly should have read, considered and thoughtfully responded to the letters after investigating whether its products were infringing the patented methods or not.

Finally, while Marvell suggests that its ‘585 Patent citing CMU’s Patents as prior art represents a “public vetting” of its activities, the Court disagrees. (Docket Nos. 833, 862). In this Court’s view, Marvell’s ‘585 Patent claiming a suboptimal method to CMU’s patents was merely a “smoke screen” designed to mask its true infringing conduct from the outside world, i.e., its use of “the original structure that Kavcic proposed” in the MNP enhancement and all of its other infringing products. (Pl. Ex. 366; see also Docket No. 920 at 71). Marvell was fully aware of CMU’s Patents at all times and proceeded to develop such technology, without

changing its behavior in any way after being notified of the patented methods by Mr. Burd, CMU, and Fujitsu. (Pl. Exs. 280, 283, 368, 366, 422, 431, 477, 823; Def. Exs. 373, 1086). Marvell also named the products after Dr. Kavcic but “disassociated” his name with the project in favor of the MNP moniker around the same time (January of 2003) when Dr. Wu acknowledged that there was no functional difference between the MNP and Dr. Kavcic’s detector. (Pl. Ex. 368; Docket No. 677 at 81). In light of same, the Court views the ‘585 Patent as an effort by Marvell to conceal its activities and this factor favors enhancement of damages.

10. Enhanced Damages Award

After carefully considering all of the parties’ arguments and the evidence of record, the Court believes that four of the *Read* factors support an award of enhanced damages (factors 1, 2, 7 and 9), four of the factors are neutral (3, 5, 6, 8), and one of the factors weighs against an award of enhanced damages (4). Overall, the Court believes that a penalty of enhanced damages should be assessed against Marvell given its:

- known willful infringement through its deliberate and extensive copying of the patented methods;
- failure to investigate the scope of the patents vis-à-vis its products and simulators at any time prior to the suit;
- failure to respond to the inquiries by CMU and Fujitsu; continued production of infringing products containing the patented methods and lack of any remedial action until after the verdict in this case; and,
- its concealment of its activities through its internal policies and its ‘585 Patent which claimed that it was operating a “suboptimal” method while Marvell and its engineers knew that the MNP detector was functionally equivalent to CMU’s patented methods.

But, even with these findings which strongly support an award of enhanced damages, the Court does not believe that the size of the unprecedented penalty sought by CMU is warranted upon weighing the other *Read* factors, particularly:

- the fact that CMU has been awarded one-hundred percent (100%) of the compensatory damages it sought at trial, which with the assessment of supplemental damages, is approximately \$1.248 billion;
- Marvell's size and financial condition, which the Court does not believe could sustain a penalty doubling or tripling this outstanding award;
- CMU's inexcusable and unreasonable delays in prosecuting this case despite the credible allegations it received of Marvell's infringement;
- the evidentiary prejudice sustained by Marvell due to these delays;
- the exponential increase in sales during this time period; and,
- the "closeness" of the damages issues which strongly affect the calculation of any enhancement.

(*See* Docket No. 920). The amount of the penalty awarded under section 284 is committed to the discretion of the Court. *Read*, 970 F.3d at 826. Based on this Court's research, there is no consensus providing a precise calculation of how to arrive at an appropriate penalty. This lack of consensus exists simply because no two cases are alike and the inquiry is fact intensive, focusing on the egregiousness of the conduct of the infringer in light of the totality of the circumstances. *Id.* at 827. Indeed, some courts finding willful infringement have denied enhancements and others have awarded penalties in varying amounts:

- denied enhanced damages, *Crystal Semiconductor*, 246 F.3d at 1352;
- twenty-percent (20%) of damages, *Powell v. Home Depot U.S.A., Inc.*, 663 F.3d 1221, 1236-37 (Fed. Cir. 2011); *i4i*, 598 F.3d at 858-59;

- twenty-five percent (25%) of damages, *Applied Medical Resources Corp. v. U.S. Surgical Corp.*, 435 F.3d 1356, 1365 (Fed. Cir. 2006);
- fifty-percent (50%) of damages, *Acumed LLC v. Stryker*, 483 F.3d 800, 810-11 (Fed. Cir. 2007);
- seventy-five percent (75%) of damages, *SynQor*, 709 F.3d at 1385;
- double damages, *Metabolite Laboratories, Inc. v. Laboratory Corp. of America Holdings*, 370 F.3d 1354, 1370-71 (Fed. Cir. 2004); *Varian*, 2012 WL 1436569, at *7; and,
- treble damages, *Golden Blount, Inc. v. Robert H. Peterson Co.*, 438 F.3d 1354, 1365-70 (Fed. Cir. 2006).

Other courts have awarded different amounts based on pre- and post-verdict activities of the infringer. *See e.g., Stryker Corp. v. Davol, Inc.*, 234 F.3d 1252, 1260 (Fed. Cir. 2000) (affirmed award of fifty percent (50%) award on pre-suit damages but double damages for post-verdict damages until entry of permanent injunction.). All told, this Court has considerable discretion in arriving at the appropriate figure. *Read*, 970 F.3d at 826.

After much deliberation, the Court will impose a penalty of 1.23 times the damages award (including the jury's verdict plus supplemental damages). In reaching this decision, the Court has considered all of the alternatives proposed by both parties, which range from no enhanced damages to twenty-percent of the verdict, as advocated by Marvell and CMU's suggested range of between \$545 million to \$2.48 billion, the latter figure which would treble damages. (Docket Nos. 793, 833, 850, 862). Having studied all of these proposals, the Court believes that each is flawed in some respect as they do not fully account for all of the circumstances which put the parties before the Court on these most contested issues. Therefore, the Court finds an intermediate sanction to be appropriate. This twenty-three percent (23%) award results in a penalty of \$287,198,828.60 and increases the total damages figure to \$1,535,889,387.60.

The Court believes that this award is sufficient to penalize Marvell for its egregious behavior and to deter future infringement activities. The Court also finds that this award is sufficiently tied to the level of culpability that Marvell exhibited throughout this case, appropriately accounts for all of the considerations set forth in *Read* and is consistent with the Court's prior decisions, (*see* Docket Nos. 900, 901, 920). The twenty-three percent (23%) penalty was not arrived at casually as the Court once again reviewed all of the damages evidence and set this amount with full consideration of its prior decision on the issue of laches, which upheld an award of approximately \$545 million in pre-suit damages only because the equities substantially weighed in CMU's favor due to Marvell's willful infringement. (Docket No. 920).

As noted with reference to its discussion of the fourth *Read* factor above, the Court does not believe that Marvell is sufficiently capitalized to sustain an award of double or treble the current damages award of \$1,248,690,559.00. The Court also believes that CMU's suggestion that the Court double either the portion of this award for pre-suit (\$545 million) or post-suit (\$694 million) infringement does not properly account for its prior findings on the issues of laches. (Docket No. 920). As a consequence, the Court has determined that any penalty could best be tied to Marvell's level of culpability and set an amount its business is able to sustain with its ongoing operations, by starting with the post-suit damages figure (\$694 million), crediting the pre-suit damages figure (\$545 million) which has been sustained only as a result of Marvell's willful infringement and doubling the result. The Court's initial calculations are as follows:

Total Post-Suit Damages	\$694,140,556
Less Presuit Damages	\$554,550,003
Subtotal *2	139,590,553
Total Enhanced Damages	\$279,181,106.00
Percentage of Verdict	22.3579%

As a next step, the Court “rounded up” the percentage of the verdict to arrive at twenty-three (23%), which results in a penalty of \$287,198,828.60 and increases the total damages figure to \$1,535,889,387.60. In terms of the reasonable royalty calculation, this enhancement results in a total royalty of \$0.615 per Accused Chip. Hence, the penalty assessed equates to \$0.115 per chip in addition to the \$0.50 per chip in compensatory damages awarded by the jury. The Court believes that this penalty is sufficiently supported by the record and warranted by the egregiousness of Marvell’s conduct. *See Read*, 970 F.2d at 826 (the “paramount determination in deciding to grant [an] enhancement and the amount thereof is the egregiousness of the defendant’s conduct based on all the facts and circumstances.”). It is also within a range that Marvell can financially support without severely damaging its business. Accordingly, the Court will impose this penalty, as stated.

D. Conclusion

Based on the foregoing, CMU’s motion for supplemental damages is granted; its motion for prejudgment interest is denied, and its motion for enhanced damages is granted, in part. In accordance with these rulings, the Court’s damages calculations are, as follows:

	<u>Type of Damages</u>	<u>Amount</u>
1	Jury Verdict	\$1,169,140,271.00
2	Supplemental Damages	\$79,550,288.00
3	Prejudgment Interest	\$0.00
4	Total Damages	\$1,248,690,559.00
5	Enhanced Damages Factor	1.23
6	Total with Enhancement	\$1,535,889,387.60

III. POST-JUDGMENT INTEREST UNDER 28 U.S.C. § 1961

The next request by CMU for an award of post-judgment interest under 28 U.S.C. § 1961 is rather straightforward and largely uncontested by Marvell. (Docket Nos. 789, 836, 852, 861). CMU requests annually compounded post-judgment interest on its entire money judgment at the statutory rate. (Docket No. 788). Marvell does not oppose, but maintains that such calculations are premature before the damage award is upheld. (Docket No. 836).

Unlike, prejudgment interest, post-judgment interest on a district court judgment is mandatory. *Air Separation, Inc. v. Underwriters at Lloyd's of London*, 45 F.3d 288, 290 (9th Cir. 1995). 28 U.S.C. § 1961 states that post-judgment interest “shall be allowed on any money judgment in a civil case recovered in a district court” and that “[s]uch interest shall be calculated from the date of the entry of the judgment, at a rate equal to the weekly average 1–year constant maturity Treasury yield, as published by the Board of Governors of the Federal Reserve System, for the calendar week preceding the date of the judgment.” 28 U.S.C. § 1961. The Supreme Court has stated that “[t]he purpose of post-judgment interest is to compensate the successful plaintiff for being deprived of compensation for the loss from the time between the ascertainment of the damage and the payment by the defendant.” *Kaiser Aluminum & Chem. Corp. v. Bonjorno*, 494 U.S. 827, 835-36 (1990). The Third Circuit holds that post-judgment interest under 28 U.S.C. § 1961 applies to the prejudgment interest component of a monetary award. *Sun Ship, Inc. v. Matson Navigation Co.*, 785 F.2d 59, 63 (3d Cir.1986).

According to CMU, the applicable treasury rate was 0.14% for the week before the Court’s judgment on January 14, 2013. (Docket No. 789 at 14). Given the clear law and the lack of true opposition, the Court finds that CMU is due post judgment interest on the total money judgment of \$1,169,140,271.00 plus supplemental damages of \$79,550,288.00 for a total of

\$1,248,690,559.00. 28 U.S.C. § 1961. CMU's motion is thus granted and post judgment interest at the rate of 0.14% is awarded on \$1,248,690,559.00, compounded annually.

IV. PERMANENT INJUNCTION/ONGOING ROYALTY

The Court's final deliberations focus on CMU's alternative requests for a permanent injunction barring Marvell's continued use of the patented methods and/or an ongoing royalty for any continued infringement by Marvell. (Docket Nos. 787, 853, 905). CMU's theory supporting the permanent injunction is that Marvell is allegedly a "collection risk" and it may be irreparably harmed by any continuing infringement because it will be unable to collect on the judgment, purportedly making money damages inadequate in this case. (*Id.*) In the event that an injunction is denied and/or delayed, CMU further requests that an ongoing royalty be imposed for any continuing infringement by Marvell at a rate of \$1.50 or treble the jury's award (consistent with Ms. Lawton's testimony) of \$0.50 per Accused Chip. (*Id.*). Marvell opposes the motion for a permanent injunction, strongly denying that it is a "collection risk" and further arguing that an injunction is inappropriate in light of *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391 (2006) and more recent Federal Circuit precedent, primarily *Apple v. Samsung Electronics Co., Ltd.*, "*Apple III*", 735 F.3d 1352 (2013),²⁴ analyzing the propriety of permanent injunctions of multi-feature products such as the instant read channel and SOC chips. (Docket Nos. 828, 863, 906). Marvell also suggests that any ongoing royalty should be lower than the jury's allegedly excessive award of \$0.50 per Accused Chip. (*Id.*).

Having fully considered these matters, and all of the pertinent evidence of record, the Court finds that CMU has not met its burden to demonstrate that the extraordinary relief of a

²⁴ In deciding these issues, the Court has carefully considered the entire series of decisions by the Federal Circuit in the *Apple v. Samsung* litigation. See e.g., *Apple, Inc. v. Samsung Elecs. Co.* ("*Apple I*"), 678 F.3d 1314, 1423 (Fed. Cir. 2012); *Apple, Inc. v. Samsung Elecs. Co.* ("*Apple II*"), 695 F.3d 1370 (Fed. Cir. 2012). The Court also reviewed and considered the more recent decision by Judge Lucy H. Koh denying Apple's final request for permanent injunction after the case was remanded. See *Apple, Inc. v. Samsung Electronics Co., Ltd.*, Civ. A. No. 11-cv-01846, 2014 WL 976898 (N.D. Cal. Mar. 6, 2014).

permanent injunction is warranted and, as the parties' efforts at negotiating an ongoing royalty have failed, the Court will impose an ongoing royalty of \$0.50 per chip sold by Marvell for its continuing infringement of the patented methods.

A. Permanent Injunction

CMU's request for a permanent injunction seeks relief under 35 U.S.C. § 283, which provides that courts "may grant injunctions in accordance with the principles of equity to prevent the violation of any right secured by patent, on such terms as the court deems reasonable." 35 U.S.C. § 283. For a permanent injunction to issue, CMU "must demonstrate that: (1) it has suffered an irreparable injury; (2) legal remedies, such as money damages, are inadequate compensation; (3) the balance of hardships warrants an injunction; and (4) the public interest would not be disserved by an injunction." *ActiveVideo Networks, Inc. v. Verizon Commn'cs, Inc.*, 694 F.3d 1312, 1337 (Fed. Cir. 2012) (citing *eBay Inc.*, 547 U.S. at 391).

The Supreme Court has cautioned that "[a]n injunction is a drastic and extraordinary remedy, which should not be granted as a matter of course." *Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 130 S.Ct. 2743, 2761, 177 L.Ed.2d 461 (2010) (citing *Weinberger v. Romero-Barcelo*, 456 U.S. 305, 311–12, 102 S.Ct. 1798, 72 L.Ed.2d 91 (1982)). Rather, "[i]f a less drastic remedy ... [is] sufficient to redress [a plaintiff's] injury, no recourse to the additional and extraordinary relief of an injunction [is] warranted." *Id.*

Apple II, 735 F.3d at 1359. "The decision to grant or deny permanent injunctive relief is an act of equitable discretion, reviewable on appeal for abuse of discretion." *Id.* (quoting *eBay*, 547 U.S. at 391). The Court next considers the parties' arguments and the facts of record in light of each of the considerations set forth in *eBay Inc.*, 547 U.S. at 391, in turn.

1. Irreparable Injury

It is now well settled that “there is no presumption of irreparable harm upon a finding of patent infringement.” *Apple III*, 735 F.3d at 1359 (citing *Robert Bosch LLC v. Pylon Mfg. Corp.*, 659 F. 3d 1142, 1148 (Fed. Cir. 2011)). “[T]o satisfy the irreparable harm factor in a patent infringement suit, a patentee must establish both of the following requirements: 1) that absent an injunction, it will suffer irreparable harm, and 2) that a sufficiently strong causal nexus relates the alleged harm to the alleged infringement.” *Id.* (citing “*Apple II*”, 695 F.3d at 1374). The Federal Circuit has clarified that:

“the causal nexus inquiry is ... part of the irreparable harm calculus,” and that “although the irreparable harm and the causal nexus inquiries may be separated for the ease of analysis, they are inextricably related concepts.” *Apple II*, 695 F.3d at 1374–75. Put another way, the causal nexus requirement is simply a way of distinguishing between irreparable harm caused by patent infringement and irreparable harm caused by otherwise lawful competition—e.g., “sales [that] would be lost even if the offending feature were absent from the accused product.” *Apple I*, 678 F.3d at 1324. The former type of harm may weigh in favor of an injunction, whereas the latter does not.

Apple III, 735 F.3d at 1359-60. A lack of commercial activity in the practicing patents does not by itself establish that the holder would not suffer irreparable harm if a permanent injunction is not issued. *eBay Inc.*, 547 U.S. 388. And even “without practicing the claimed invention, the patentee can suffer irreparable injury.” *Presidio Components, Inc. v. Am. Technical Ceramics Corp.*, 702 F.3d 1351, 1363 (Fed. Cir. 2012). However, Courts have more commonly found irreparable injury warranting an injunction in cases between direct competitors. *See e.g. Praxair, Inc. v. ATMI, Inc.*, 479 F. Supp. 2d 440, 444 (D. Del. 2007); *LaserDynamics, Inc. v. Quanta Computer, Inc.*, No. 2:06-cv-348, 2010 WL 2574059, at *2 (E.D. Tex. June 22, 2010).

It is CMU’s burden to demonstrate that it will sustain an irreparable injury absent the issuance of a permanent injunction barring continuing infringement of the patented methods by

Marvell. *See Apple III*, 735 F.3d at 1359. To meet its burden, CMU argues that it is likely to sustain irreparable injury because of “concerns” about its ability to collect the judgment against Marvell in light of *Robert Bosch LLC v. Pylon Mfg. Corp.*, 659 F.3d 1142, 1154-55 (Fed. Cir. 2011). CMU specifies that “[t]he factual predicate underlying [its] request for injunctive relief is the risk that [it] will not be able to collect monetary damages awarded against Marvell, and therefore CMU will be denied any remedy whatsoever for Marvell’s future (and even its past) infringement.” (Docket Nos. 787 at 2; 905 at 4). CMU supports its “collection risk” theory with all of the following: (1) Defendant Marvell Technology Group, Ltd. (“MTGL”) is incorporated in Bermuda, such entity may hold the majority of Marvell’s assets and its SEC filings state that a civil judgment “would not be automatically enforceable” in Bermuda courts; (2) Marvell has recently dissipated significant liquid assets through its share repurchase program and issuance of dividends; (3) Marvell’s SEC filings state that it has not set aside any assets to satisfy the judgment; and (4) media reports in late 2013 suggested that Kohlberg, Kravis, Roberts & Co. (“KKR”) may be considering a leveraged buyout of Marvell. (*Id.*).

Marvell objects to the entry of a permanent injunction on any of the bases set forth by CMU and maintains that the “collection risk” theory is both legally and factually unsupported. (Docket Nos. 828, 863, 906). Marvell counters CMU’s evidence with declarations from its Chief Executive Officer affirming that Marvell will pay any judgment awarded in this case which is affirmed by the higher courts, (*see* Docket No. 828 at Ex. 2), and another from its current Chief Financial Officer that it is not engaged in any negotiations with any entity as to a leveraged buyout or other extraordinary corporation transaction, (*see* Docket No. 922-3 at ¶ 2). Marvell further advocates that the proposed injunction is legally unsound under the *Apple III* decision

because CMU has failed to demonstrate a sufficient causal nexus between the alleged infringement and the asserted irreparable harm. (Docket Nos. 828, 863, 906).

The Court agrees with Marvell that CMU has failed to demonstrate irreparable harm in this case. CMU's "collection risk" theory relies heavily on the Federal Circuit's discussion of the financial instability of the defendant in *Robert Bosch LLC v. Pylon Mfg. Corp.*, 659 F.3d at 1153-56. Yet, a careful reading of that decision clearly demonstrates that it is distinguishable from the instant matter for a number of reasons. *Id.* First, unlike CMU, which is proceeding solely under the "collection risk" theory, Bosch claimed that it was irreparably harmed because it: practiced the infringed patents and was a direct competitor of Pylon; had lost market share and customers to Pylon as a result of the infringement; and Pylon lacked the financial ability to pay a judgment. *Id.* Second, the court found that irreparable harm was established as a result of the direct competition with the practicing patentee, lost market share and lost customers, none of which are present here. *Id.* Third, the evidence of Pylon's financial instability was uncontested and even its own attorneys could not provide any assurances to the court that a monetary judgment could be satisfied. *Id.* To this end, Bosch presented uncontested evidence of Pylon's financial instability including a financial report stating that it was a "moderate risk of severe financial stress, such as bankruptcy, over the next 12 months," and had a risk factor in the 49th percentile of all companies nationally and also presented evidence that its parent company which held 100% of the company's stock had "obtained a five million dollar loan at a rate of 8.46%." *Id.* (emphasis added). In reaching its decision to enter a permanent injunction, the Federal Circuit emphasized that Pylon did not contest such evidence and found it "troublesome" that it had "fail[ed] to submit rebuttal evidence regarding its ability to satisfy an award of money damages." *Id.* The Federal Circuit went so far as to point out that even during oral argument on appeal,

Pylon's counsel could not "offer express assurances" that it was financially able to pay the judgment. *Id.* at n.6. In contrast, both Marvell and its counsel have stated, on the record, that it will pay the judgment in this case, rebutting the evidence presented by CMU.²⁵ (See Docket Nos. 828 at Ex. 2; 912 at 15).

The other cases relied upon by CMU for the proposition that a patentee may sustain irreparable injury based on an asserted inability of an infringer to pay a judgment are likewise distinguishable as each of the infringers in those cases faced severe financial distress, including: an infringer that could not afford to pay its former attorneys or hire new counsel to respond to a summary judgment motion, *see Custom Designs of Nashville, Inc. v. Alsa Corp.*, 727 F. Supp. 2d 719, 726-27 (M.D. Tenn. 2010); an infringer which admitted the infringement litigation was a "make or break event" for the company and two weeks after the jury's verdict entered into the Australian equivalent of bankruptcy, *see Retractable Technologies, Inc. v. Occupational & Med. Innovations, Ltd.*, 6:08-CV-120, 2010 WL 3199624, at *5 (E.D. Tex. Aug. 11, 2010); and an infringer which was deemed to be insolvent by the court, *see Sundance, Inc. v. Demonte Fabricating Ltd.*, 2007 WL 3053662, at *1 (E.D. Mich. 2007), *rev on other grounds*, 550 F.3d 1356 (Fed. Cir. 2008). Marvell simply does not face any of these types of dire financial circumstances as the company is doing well financially, remains able to pay its many attorneys and is neither insolvent nor a risk for bankruptcy.²⁶

²⁵ Specifically, Marvell's attorneys state, as officers of the court, that the evidence they has presented regarding Marvell's financial condition "confirms that Marvell is positioned to follow through" on Dr. Sutardja's "commitment to pay any final damages award that survives appeal." (Docket No. 912 at 15). Such statements are made by counsel pursuant to its obligations under Rule 11(b)(3), which requires a certification by the attorney that such "factual contentions have evidentiary support." FED. R. CIV. P. 11(b)(3).

²⁶ The Court notes that the above discussion concerning Marvell's size and ability to pay focused on whether it was sufficiently capitalized to withstand a penalty of treble or double damages without severely damaging its business. *See* § II.C.4., *supra*. That discussion does not undermine the Court's belief that Marvell is financially able to meet the current obligations to CMU, with the enhancement imposed by the Court, and the payment of any ongoing royalty.

CMU next argues that it will suffer irreparable harm without the entry of an injunction because MTGL is a foreign corporation registered in Bermuda and a civil judgment is not automatically enforceable against it in that country. (Docket No. 787 at 9). CMU relies on *O2 Micro Intern. Ltd. v. Beyond Innovation Tech. Co., Ltd.*, Civ. Action No. 2-04-CV-32 (TJW), 2007 WL 869576, at *2 (E.D. Tex. Marc. 21, 2007), *vacated and remanded on other grounds*, 521 F.3d 1351 (Fed. Cir. 2008), for the proposition that a permanent injunction should issue when a foreign infringer is unable to provide assurance to the patentee that it will be able to collect monetary damages. (Docket No. 787 at 9). But, the irreparable injury set forth by patentee in that case was the loss of market share to the directly competing patentee rather than the fact that the defendants were foreign corporations. *Id.* Also, the District Court pointed out that all three of the infringing entities were foreign corporations. *Id.* Thus, the facts of this case are very different from *O2 Micro* because: the instant parties do not compete; CMU does not practice the patents and has no portion of the market; the only irreparable harm claimed by CMU is based on the alleged “collection risk” of Marvell; and only MTGL is a foreign corporation while MSI is incorporated in the United States.

In this Court’s estimation, Marvell has also sufficiently rebutted CMU’s reliance on the passage from MTGL’s 10-K reports and other SEC filings concerning the non-automatic enforceability of the judgment in Bermuda courts. CMU suggests that the situs of MTGL’s incorporation is a “self-imposed obstacle to enforcement.” (Docket No. 787 at 9). However, Marvell has presented an affidavit of Dr. Sehat Sutardja, the Chief Executive Officer of the Bermuda corporation, MTGL, which expressly states that it will pay any judgment awarded in this case which is upheld on appeal. (*See* Docket No. 828 at Ex. 2). Even if CMU is correct that it will have some difficulty collecting the judgment in Bermuda, because the courts in that

country may not automatically reduce this Court’s judgment in order to immediately effectuate collection, it has not demonstrated that it would be unable to enforce Dr. Sutardja’s subsequent promise to pay the judgment in Bermuda. (Docket Nos. 787, 853, 905). In light of the uncontested affidavit, it appears that Marvell has largely removed any “self-imposed obstacle” to collection in Bermuda. At most, CMU has established that collection may not be “automatic” such that some legal proceedings may need to be initiated against MTGL in Bermuda in order to collect the entirety of the judgment. The potential need to initiate some type of legal proceedings in Bermuda is not sufficient to show that CMU may be irreparably harmed. *Apple III*, 735 F.3d at 1359 (“a patentee must establish ... that absent an injunction, it will suffer irreparable harm”).

Additionally, on this Court’s record, CMU has not demonstrated that Marvell maintains insufficient assets in the United States to satisfy the judgment, possibly making the need to pursue MTGL in Bermuda unnecessary, if Dr. Sutardja does not own up to his promise. In fact, CMU has expressly argued that both MTGL and MSI own substantial assets in the Northern District of California which may be sufficient to satisfy all of the judgment, which, at the time, was “in excess of \$1.16 billion.” Specifically, CMU’s counsel averred the following:

MTGL and MSI own substantial assets located in the Northern District of California that could satisfy a significant portion or all of the Judgment. MTGL’s U.S. headquarters, which houses research and design functions as well as substantially all of its sales, marketing, administration, and operations, is located in Santa Clara, California, which lies within the Northern District of California. *See* Ex. I. According to MTGL’s SEC filings, it (likely through subsidiaries) owns the company’s Santa Clara facility, which consists of approximately 993,000 square feet on 33.8 acres of land. *Id.* MSI, which is MTGL’s operating subsidiary, maintains its headquarters and principal place of business at the Santa Clara facility. *See* Dkt. 25-7; Dkt. 26, at 4-7; Ex. J (Marvell website description of company). Given that both MTGL and MSI have a very significant presence in the Northern District of California, CMU states on information and belief that additional and

substantial assets will likely be found in that judicial district and in other districts in California.

(Docket No. 909 at 8). CMU further points out in the same brief that MTGL “owns or leases real property in several U.S. states.” (*Id.*). It also repeatedly references the amount of liquid assets held by Marvell but never describes where those assets are located. (*See* Docket No. 909-2). Accordingly, the Court dismisses CMU’s “Bermuda incorporation theory” as speculative and sufficiently rebutted by the evidence advanced by Marvell.

The Court also disagrees with CMU’s other theories making Marvell a “collection risk” including: the share repurchase program and issuance of dividends; the failure to set aside reserves for the judgment; and/or the supposed KKR leveraged buyout transaction. (Docket Nos. 787 at 2; 905 at 4). All of these claims are likewise rebutted by the affidavit of Dr. Sutardja. (*See* Docket No. 828 at Ex. 2). Further, each remains unproven for additional reasons. With respect to the share repurchase program and dividends, CMU has presented no evidence that such program was initiated in order to avoid judgment and its own expert continues to estimate that even with such program Marvell will have around \$2 billion in liquid assets throughout fiscal 2014. (*See* Docket Nos. 909-2, 909-3). The Court fully expects that the asserted failure to set aside reserves to pay the judgment will be resolved in the context of the parties’ ongoing bond negotiations which are being supervised by the Special Master.²⁷ In this regard, the prior filings related to the parties’ bond disputes indicate that Marvell would likely be qualified for a bond in an amount of \$1.5 billion, an amount which will cover the current judgment. (Docket No. 915-1 at ¶ 3). Finally, the supposed KKR deal was affirmatively countered by Marvell’s statement that it was not involved in that type of an extraordinary corporate transaction

²⁷ The Court notes that, with the parties’ consent, the Honorable Thomas T. Frampton has been appointed to serve as a Special Master in this case. (Docket No. 930). Judge Frampton is presently a shareholder at the law firm of Goehring Rutter & Boehm and previously served as a Judge for the Mercer County Court of Common Pleas.

demonstrating that the media reports relied upon by CMU were pure speculation. (Docket No. 922-3 at ¶ 2).

For all of these reasons, the Court finds that CMU’s “collection risk” theories are unproven and do not support a finding that it will be irreparably harmed without the imposition of a permanent injunction. *See Robert Bosch*, 659 F.3d at 1153-56. CMU has presented no direct evidence that Marvell will not pay the judgment or that Marvell has a history of dilatoriness in paying its debts and the Court has already determined that it is sufficiently capitalized to withstand the current judgment (including the enhancement). The Court is likewise not persuaded that Marvell will be unable to meet its future obligations to pay an ongoing royalty such that CMU will be unable to collect additional monies stemming from the continuing infringement.²⁸ As such, CMU has therefore failed to meet its burden to demonstrate that it will be irreparably harmed without the imposition of a permanent injunction due to the alleged inability of Marvell to pay a money judgment. *Apple III*, 735 F.3d at 1359.

With this holding, the Court need not specifically address Marvell’s well-taken arguments that an injunction should not issue to bar its continued production of its multi-feature read channel chips given *Apple III* and the other reasons proffered by Marvell. *Cf. Apple III*, 735 F.3d at 1363 (“[T]his argument seems to be premised on the mistaken notion that the causal nexus is a separate factor from irreparable harm. As we have explained, however, the causal nexus requirement is part of the irreparable harm factor. Without a showing of causal nexus, there is no relevant irreparable harm. In other words, there cannot be one without the other.”).

²⁸ The Court notes that the ongoing post-judgment infringement, which is considered in the context of the ongoing royalty discussion in the following section, includes additional sales of 299,042,568 chips from January 15, 2013 until November 2, 2013. (Docket No. 907). Additional accountings have not yet been made but quarterly accountings will be required by the Court’s corresponding Order to be issued with this Opinion. Commensurate sales of chips developed using the infringing simulators and containing the infringing technology are expected to continue until the proposed design around is completed and into the future. So, Marvell’s continuing infringement will likely result in significant continuing royalties due to CMU.

The Court acknowledges that the parties have presented interesting arguments regarding the reach of *Apple III* and whether CMU should be able to avoid the import of its discussion of the nature of the products by couching its irreparable harm arguments to challenge only the alleged collection issues. (Docket Nos. 905, 906). The Court also notes that the nature of the read channel chips, when coupled with the other evidence that CMU does not practice the patents, has exhibited a willingness to license same to Marvell specifically, and has failed to demonstrate that Marvell is a “collection risk,” certainly counsels against the issuance of a permanent injunction in this case.

Marvell’s read channel chips are multi-feature products, covered by many patents owned by Marvell, and supplemented by numerous unpatented features. *Cf. Apple IV*, 2014 WL 976898 at *19 (“Smartphones and tablets are complex devices embodying hundreds of features, inventions, and components.”). The infringed methods essentially operate within the read channel chips to reduce media noise and improve the performance of the chips. *Id.* The *Apple v. Samsung* line of cases has made clear that a patentee seeking an injunction of such a multi-feature product is required to “show that the infringing feature drives consumer demand for the accused product ... [and] this inquiry should focus on the importance of the claimed invention in the context of the accused product, and not just the importance, in general, of features of the same type as the claimed invention.” *Apple III*, 735 F.3d at 1364. The patentee must demonstrate:

some connection between the patented feature and demand for [the infringer’s] products. There might be a variety of ways to make this required showing, for example, with evidence that a patented feature is one of several features that cause consumers to make their purchasing decisions. It might also be shown with evidence that the inclusion of a patented feature makes a product significantly more desirable. Conversely, it might be shown with

evidence that the absence of a patented feature would make a product significantly less desirable.

Id. Yet, the Federal Circuit has held that the weight and credibility of the evidence presented on these issues are discretionary for the Court such that a patentee presenting some evidence showing that the patented feature drives demand does not, by itself, demonstrate irreparable harm. *Id.* Again, this is just one of many factors which must be weighed by the Court. *Id.*

While CMU has continually and repeatedly touted its invention as “must have” for Marvell and its customers, the Court need not look much farther than the damages evidence to conclude that these are multi-feature products which have many valuable non-infringing aspects. On the other hand, as the Court recounted in its JMOL opinion, Marvell did not introduce evidence at trial valuing these other components of its read channel chips, for reasons unknown to the Court. (*See* Docket No. 901). In any event, Ms. Lawton engaged in an “excess profits” analysis to value the patented methods in this case, resulting in her opinion at trial that the infringement was worth \$1.16 billion. (Docket No. 713 at 11). Her “excess profits” analysis started with calculating the price-per-chip (\$4.42) and operating profit-per-chip (\$2.16) based on Marvell’s internal sales data. (*Id.*). She then compared the sales of Marvell’s chips to certain customers (Maxtor and Toshiba) for which she had information from the same time period (2003) where products were sold with and without the addition of the allegedly infringing MNP detector, resulting in a range of between \$0.06 and \$0.72 per chip. (*Id.*). She ultimately opined that the reasonable royalty would be near the high end of this range, \$0.50, based on the opinion of Dr. Christopher Bajorek that the patented methods were “must have” for Marvell and its customers because of the increased performance of the chips. (*Id.*). But, Ms. Lawton’s opinions make clear that Marvell otherwise met its profit margin goal of fifty percent of the total revenue generated by the sales of the Accused Chips, even with paying its “excess profits” attributable

solely to the inclusion of the patented methods to CMU. So, while there is evidence that the patented methods made the Accused Chips “more desirable,” it cannot be said that there is no value to the numerous other features in the chips which are not addressed by the patented methods and those features have collectively generated more profit for Marvell, (i.e., \$1.66 per chip), than the addition of the patented methods, (i.e., \$0.50 per chip), even with the “must have” valuation of the patents by Ms. Lawton.

Based on the *Apple v. Samsung* line of cases, the sufficiency of the “casual nexus” evidence is a matter of degree to be determined by the District Court in its discretion. *See Apple III*, 735 F.3d at 1364. Given same, while CMU has presented evidence that the patented methods added value to the read channel chips, in the absence of a showing as to how customers and/or the market valued the other numerous features in the read channel chips vis-à-vis the features of the patented methods, the “must have” evidence is not as strong as CMU suggests. Indeed, the record is not sufficiently developed for the Court to conclude definitively that the patented methods outweighed the significance of the other features to customers given the obvious value of the Accused Chips, even without the patented methods. *Cf. Apple IV*, 2014 WL 976898 at *19 (“The various consumer surveys presented to the Court, including Dr. Hauser's survey, do no more than confound the Court’s efforts to determine whether—of the many smartphone and tablet features such as the camera, screen quality, operating system, and screen size—the three patented features at issue here drive consumer demand. Put another way, the evidence shows that the three patented features may add to a device's appeal, but Apple has not shown that these specific features are among several that ‘cause consumers to make their purchasing decisions’ or otherwise drive consumer demand”). As a consequence, this Court would likely require a more specific showing from CMU prior to enjoining these types of products but further proceedings on

these issues are unnecessary in light of the Court's determination that CMU has not demonstrated that it will be irreparably harmed by Marvell's financial condition and it has repeatedly asserted that this is the sole basis for the permanent injunction it seeks. (*See e.g.*, Docket Nos. 787, 905).

For these reasons, the Court concludes that CMU has failed to meet its burden to establish irreparable harm and such finding weighs strongly against the imposition of a permanent injunction.

2. Adequacy of Legal Remedies

"This factor requires a patentee to demonstrate that 'remedies available at law, such as monetary damages, are inadequate to compensate' the patentee for the irreparable harm it has suffered." *Apple III*, 735 F.3d at 1368 (citing *eBay*, 547 U.S. at 391). This Court is directed to "assess whether a damage remedy is a meaningful one in light of the financial condition of the infringer before the alternative of money damages can be deemed adequate." *Robert Bosch LLC*, 659 F.3d at 1155. Further, "unlike an infringer's inability to pay a judgment, which may demonstrate the inadequacy of damages, a defendant's ability to pay a judgment does not defeat a claim that an award of damages would be an inadequate remedy. Rather, a defendant's ability to pay merely indicates that a court should look to other considerations to determine whether a damages award will adequately compensate the patentee for the harm caused by continuing infringement." *Apple III*, 735 F.3d at 1369. Thus, the Court must decide if a damages remedy is adequate to compensate the patentee for the alleged irreparable harm rather than the underlying infringement. *Cf. id.*

In order to sustain its burden on this prong, CMU relies on the same evidence and reiterates its arguments that Marvell is financially unable to pay a judgment on both the past and

continuing infringement and/or may seek to avoid same given the foreign incorporation of MTGL. (Docket Nos. 787, 905). As the Court has rejected this position, and found that CMU has not demonstrated irreparable harm, CMU has likewise failed to demonstrate that an award of money damages for the past and continuing infringement is inadequate as a matter of law. Accordingly, this factor counsels against entering a permanent injunction in this case.

3. Balance of Hardships

“The balance of hardships factor ‘assesses the relative effect of granting or denying an injunction on the parties.’” *Apple III*, 735 F.3d at 1371 (quoting *i4i*, 598 F.3d at 862). Proper considerations under this factor include “the parties’ sizes, products, and revenue sources.” *I4i*, 598 F.3d at 862. Matters that are irrelevant to the inquiry include the consequences to the infringer as a result of its infringement, such as, the costs of product redesigns, lost future commercial successes, and sunk development costs. *Id.*

As CMU has failed to convince this Court that Marvell would be unable to pay the judgment, the Court finds that CMU has not articulated any appropriate reason as to how or why the proposed permanent injunction would benefit it. Again, CMU stands to be paid in excess of \$1.5 billion for past infringement and will be due any additional royalties for continuing infringement, as is discussed in the following section of this Opinion. *See* § IV.B., *infra*. Any injunction barring future infringement of the patented methods would cut off continuing infringement and stop what could be a significant revenue stream to CMU. This revenue stream will likely exceed an additional \$100 million annually on top of the already substantial judgment to be entered in this case. It is certainly well in excess of the “highly speculative forecast” of two million dollars annually which CMU’s Technology Transfer Office forecasted in 2006. (Def. Ex. 272). Additionally, there is no competition between the parties; CMU does not practice the

methods; and, it has no licensing arrangements for these patents outside of its DSSC program, under which its members such as Seagate have free “use” rights.²⁹ Therefore, CMU is presently in a position where it can either license the patents to Marvell for a handsome royalty or not license them at all.

In contrast, if an injunction were granted, there could plainly be harm to Marvell beyond the costs of redesigns, lost future commercial successes and sunk development costs, although Marvell has and will continue to incur such expenses as it proceeds with its redesign of future chip lines. *I4i*, 598 F.3d at 862. As has already been discussed, the Accused Chips are multi-feature products with many non-infringing features and any injunction would bar these non-infringing features as well as the infringing ones. The Court has also concluded that CMU’s “must have” evidence alone is not sufficient to meet the clarified standards for obtaining a permanent injunction of these types of products under the *Apple v. Samsung* line of cases. Further, CMU cannot meaningfully contest that an immediate injunction would significantly impair Marvell’s customers, as Marvell’s lengthy sales cycle would preclude it from generating redesigned products for over a year, leaving its customers without chips to incorporate into their hard drives and other devices. (Docket No. 828 at 16, at Ex. 3). Moreover, the process of disabling the infringing features of the more than 2 billion chips that have already been sold is basically impossible and the cost of disabling the infringing features in existing chips that have yet to be sold would be significant. (*Id.*). Finally, based on CMU’s infringement theory presented at trial, any injunction which would only bar the use of the simulators rather than the chips themselves would effectively stop production of all of Marvell’s chips and cause the same type of harm that has already been discussed.

²⁹ Despite the verdict and the post-trial filings and proceedings, CMU has not identified any additional licensing agreements for this technology. (Docket Nos. 787, 853, 905).

For these reasons, the Court believes that this factor also favors Marvell but only slightly because the Court does not believe that CMU would be harmed by continuing infringement as such infringement would generate significant compensation.

4. Public Interest

The last factor that the Court must consider is whether “the public interest would be disserved by an injunction.” *Apple III*, 735 F.3d at 1371 (citing *eBay*, 547 U.S. at 391). “[T]he touchstone of the public interest factor is whether an injunction, both in scope and effect, strikes a workable balance between protecting the patentee’s rights and protecting the public from the injunction’s adverse effects.” *i4i*, 598 F.3d at 863 (citing *Broadcom Corp. v. Qualcomm, Inc.*, 543 F.3d 683, 703-04 (Fed. Cir. 2008)). The members of the public to be considered include the infringer’s vendors, manufacturers, customers, end-user consumers, and other members of distribution channels for the infringing products. *Id.*

The Court recognizes that there is a strong public interest in enforcing CMU’s patent rights because this technology was sponsored, in part, by public funding. *Precision Instrument Mfg. Co. v. Auto. Maint. Mach. Co.*, 324 U.S. 806, 815-16 (1945). However, the scope and effect of the proposed injunction in this case would in all likelihood cause significant harm to all of the companies which unwittingly participate in some fashion in the production and distribution of Marvell’s read channel chips. Marvell is the dominant leader in the production of these types of chips and has approximately a sixty percent (60%) market share. (Docket No. 707 at 122). The downstream effects of any such injunction could be very significant, as increased prices set by the market leader would be passed down the stream of commerce to the ultimate end-purchaser of computers and like equipment containing the subject chips. Distribution delays would likewise have a dramatic effect on the hard drive manufacturers, like Seagate, computer

manufacturers and the retailers of same. Ultimately, the imposition of an injunction may force semiconductor businesses like Marvell completely offshore which would not be in the best interest of the public. It would also undermine what Dr. Kryder explained was one of the primary purposes of the National Science Foundation's support of the establishment of the DSSC at CMU, i.e., to promote domestic research and production of this type of technology and to prevent such business from moving to other countries. (Docket No. 682 at 27-28).

Accordingly, the Court finds that the public interest would be disserved by the entry of a permanent injunction in this case.

5. Conclusion

Based on the foregoing, CMU's motion for a permanent injunction [787] is denied as CMU has failed to demonstrate that Marvell is unable to pay the past and future damages resulting from its infringement. However, such denial is without prejudice, to CMU renewing its motion in the event that credible and significant evidence well beyond that which has already been presented demonstrates that Marvell's financial condition has worsened to such an extent that it cannot pay future damages.

B. Ongoing Royalty

While the Court has declined to impose the requested permanent injunction, an ongoing royalty for continuing infringement of the patented methods will be assessed. The Federal Circuit has held that:

[i]n most cases, where the district court determines that a permanent injunction is not warranted, the district court may wish to allow the parties to negotiate a license amongst themselves regarding future use of a patented invention before imposing an ongoing royalty. Should the parties fail to come to an agreement, the district court could step in to assess a reasonable royalty in light of the ongoing infringement.

Paice LLC v. Toyota Motor Corp., 504 F.3d 1293, 1315 (Fed. Cir. 2007). In undertaking this assessment, the Court weighs the traditional *Georgia-Pacific* factors³⁰ to arrive at a reasonable royalty which is adequate to compensate the patentee for the continued infringement. *Id.* The Court is not bound by the royalty rate that the jury determined was appropriate for prejudgment infringement because of the possible changed bargaining positions of the parties. *Varian*, 2012 WL 1436569, at *11 (citing *Amado v. Microsoft Corp.*, 517 F.3d 1353, 1361–62 (Fed. Cir. 2008)).

1. Failed Negotiations

Pursuant to the Federal Circuit’s well-advised suggestion in *Paice* that the parties should be permitted to negotiate any future ongoing royalty payments amongst themselves, the Court ordered the parties to meet and confer to negotiate an ongoing royalty after the initial filing of post-trial motions. (Docket No. 865). The parties were unsuccessful and advised the Court that they “remain[ed] very far apart” at that point. (Docket No. 871). In an effort to bridge the gap between the parties, the Court ordered lead trial counsel and party representatives with full settlement authority to participate in Court-annexed mediation³¹ the morning before oral argument on post-trial motions. (Docket No. 872). Unfortunately, they were unable to reach any resolution or agreement at that time and have not indicated any willingness to return to the negotiating table in the interim.³²

2. Ongoing Royalty

As the parties have been unable to negotiate an ongoing royalty for the continuing infringement, the Court must step in to assess a reasonable royalty in light of the ongoing infringement. *Paice*, 504 F.3d at 1315. The parties’ positions as advocated in their papers are

³⁰ See *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116 (S.D.N.Y. 1970).

³¹ See n.14, *supra*.

³² The parties are, however, negotiating the aforementioned bond at present.

consistent with their “very far apart” report as CMU argues that the ongoing royalty should be set at up to \$1.50 per Accused Chip given the finding of willful infringement while Marvell suggests that the ongoing royalty should be set at a rate much less than the jury’s allegedly excessive award of \$0.50 per Accused Chip. (Docket Nos. 787, 837, 853, 863). Having fully considered the parties’ positions in light of the jury’s verdict, all of the Court’s post-trial rulings and the relevant *Georgia-Pacific* factors, the Court believes that a reasonable royalty for the ongoing infringement is \$0.50 per Accused Chip.

In reaching this decision, the Court recognizes that it is not bound by the jury’s findings that \$0.50 is a reasonable royalty and that “pre-suit and post-suit acts of infringement are distinct, and may warrant different royalty rates given the change in the parties’ legal relationship and other factors.” *Paice*, 504 F.3d at 1317 (Rader, J., concurring). However, the Court finds the jury’s determination reasonable as CMU’s trial presentation of this royalty rate was well-supported by Ms. Lawton’s credible and comprehensive testimony. The Court believes that the parties at a hypothetical negotiation at this juncture of the case would likely reach the same figure, even with changes in the parties’ legal relationship and considering any other changes in the parties’ positions since the verdict.

At this point, CMU is a prevailing patentee which has been awarded one-hundred (100%) percent of the compensation it sought through a substantial award of compensatory damages, accounting for every \$0.50 in Marvell’s “excess profits” which its expert attributed to the inclusion of the patented methods in each chip. It has also received an additional twenty-three percent (23%) compensation on the pre-judgment royalties, which equates to an additional \$0.115 per Accused Chip. *See* § II.C., *supra*. All told, CMU has received one hundred twenty-

three percent (123%) compensation for the pre-judgment infringement, or \$0.615 per Accused Chip, for a judgment award totaling in excess of \$1.5 billion. *Id.*

While this award can be appropriately characterized as very significant, the return on investment by CMU is at best described as staggering. The record is uncontested that CMU developed these patents through its DSSC program with public grants and the support of corporate donors. (Docket No. 901 at 10). Its own financial investment in the research and development of the patents has never been quantified during these proceedings but under any measure would be considered extraordinarily insignificant when compared to the present award.

Given the valuation of these “must have” and “industry standard” patents, CMU’s marketing efforts, or lack thereof, is stunning to the Court.³³ CMU then ignored repeated allegations of infringement from the inventors and took nearly six full years to decide whether to pursue litigation, never following up with Marvell during this time period. (Docket No. 920). It received similar allegations about other entities but to this Court’s knowledge has not pursued them. (*Id.*). And, despite the verdict, CMU has not negotiated licenses with any other third parties.

From the Court’s view, CMU appears largely satisfied with the exceptional returns on its minimal financial investments in these patents and only questions whether it will be able to collect the judgment against Marvell.³⁴ Accordingly, the Court believes that CMU would accept an ongoing royalty of \$0.50 per Accused Chip for the continuing infringement rather than the requested \$1.50 per Accused Chip or some rate between those two figures, including the

³³ To this end, CMU: sent out initial correspondence to DSSC members Seagate and IBM in 2001 announcing the patents; sent its “friendly” licensing letters to fourteen companies, including Marvell, in 2003; and had some unsuccessful negotiations with Intel in 2004 which included a brief discussion of these patents. (See Docket No. 920 at 12-13 (citing Pl. Exs. 422; 431; Def. Exs. 182, 185; 225; 226; 227; 229; 230; 231; 232; 233; 234; 1573); 901 at 12 (citing Def. Exs. 255, 263; Docket No. 682 at 100, 183-85)).

³⁴ The Court acknowledges that CMU also seeks to recover its attorneys’ fees in this litigation. The Court postponed its decision. (Docket No. 884). The Court does not consider same as part of its “investment” in the patents.

effective rate of \$0.615 per Accused Chip which it has been awarded for the pre-judgment infringement and willfulness. CMU effectively seeks to have the Court impose a higher rate than the jury's assessment to punish Marvell for its willfulness rather than arriving at that figure after undertaking a comprehensive *Georgia-Pacific* analysis.³⁵

Marvell stands before the Court as an adjudicated willful infringer which has been ordered to pay substantial compensatory and punitive damages to CMU in order to account for its unlawful conduct. While the award is very high due, in part, to CMU's inaction, it is a just award given the scale and scope of the infringement and its utter disregard for CMU's patent rights. Marvell remains in a position where it needs to continue to use its simulators and include the infringing methods in its read channel chips for the foreseeable future. But, Marvell has started to redesign certain of its read channel chips and avers that its redesign will be concluded by the end of this year. (Docket No. 833 at 23). If successful at developing non-infringing products, Marvell will have the ability to walk away from the patented technology.³⁶

As Ms. Lawton discussed at trial, Marvell also has the option of moving a large portion of its operations to an overseas location in an effort to avoid incurring a significant portion of the expected future damages. (Docket Nos. 686, 710). This could be achieved by moving its simulators and testing programs offshore along with other significant aspects of its U.S. based sales cycle and these moves could limit the amount of ongoing royalties to only those resulting from its inducement of customers located in the United States to use the patented methods. But, this scenario is unlikely as Marvell is ingrained in its Silicon Valley headquarters having made significant investments in infrastructure and key personnel at that location and conducting nearly

³⁵ Indeed, while Lawton has submitted numerous post-trial declarations in support of CMU's various motions, CMU has not put forth her opinion on the results of a post-trial hypothetical negotiation between these parties.

³⁶ It is unknown whether Marvell's customers will accept these redesigned products.

all of its sales cycle activities from there. (Docket Nos. 802-2 at ¶ 20; 802-1 at ¶¶ 6-9). Further, as explained in the context of the Court’s discussion responding to CMU’s request for an injunction, Marvell’s products contain numerous non-infringing features which undoubtedly provide significant value to its customers and end-users. *See* § IV.A., *supra*. Considering all of these factors, the Court believes that Marvell should be willing to pay an ongoing royalty of \$0.50 for the continuing infringement, rather than the lesser amounts it has suggested.

3. Conclusion as to Ongoing Royalty

With these findings, and after weighing the relevant *Georgia-Pacific* factors, the Court holds that a post-trial hypothetical negotiation between CMU and Marvell would result in the parties agreeing to a reasonable ongoing royalty of \$0.50 per Accused Chip. Accordingly, CMU’s motion is granted to the extent that an ongoing royalty of that amount will be ordered for the ongoing infringement. The Court will further order that Marvell make periodic, quarterly accountings of its continuing sales to CMU; that the parties meet and confer to reach agreement on pertinent sales data and continuing damages from the ongoing royalty; and, provide the Court with status reports outlining same going forward.³⁷

As a final point, considering the present status of the parties’ bond negotiations, wherein the parties are actively meeting with a court-appointed Special Master to determine the appropriate level of financial security for Marvell’s forthcoming appeal, (Docket No. 930), the Court will deny, without prejudice, CMU’s requests that an escrow account be established and that Marvell deposit any ongoing royalties in same and refer such requests to the Special Master with the same direction as the initial referral of the bond issues, i.e., the parties should initially be granted the opportunity to negotiate these issues and, if necessary, present any contested matters

³⁷ To the extent that the quarterly accountings process engenders disputes, the Court will appoint a Special Master to resolve same.

to the Special Master for resolution through a Report and Recommendation directed to the Court. *See* FED. R. CIV. P. 53. However, the immediate priorities for the parties and the Special Master remain to finalize the bond issues so that a final judgment can be entered and Marvell can take its appeal.

V. CONCLUSION

Based on the foregoing, CMU's Motions [788], [786] and [790] are granted, in part, and denied, in part. As explained herein, CMU's requests for prejudgment interest and a permanent injunction are denied and its requests for supplemental damages, enhanced damages, post-judgment interest and an ongoing royalty are granted. A summary of the damages award is, as follows:

	<u>Type of Damages</u>	<u>Amount</u>
1	Jury Verdict	\$1,169,140,271.00
2	Supplemental Damages	\$79,550,288.00
3	Prejudgment Interest	\$0.00
4	Total Damages	\$1,248,690,559.00
5	Enhanced Damages Factor	1.23
6	Total with Enhancement	\$1,535,889,387.60
7	Post-Judgment Interest	0.14%
8	Ongoing Royalty	\$0.50 per chip

As noted in the Court's prior Orders, the parties will be directed to meet and confer and present the Court with a proposed final judgment in light of these rulings and the prior rulings in this

case. They are also to proceed to negotiate the bond issues with the court-appointed Special Master. An appropriate Order follows.

s/Nora Barry Fischer
Nora Barry Fischer
United States District Judge

Date: March 31, 2014

cc/ecf: All counsel of record